



NATIONAL BOARD FOR TECHNICAL EDUCATION

PLOT B BIDA ROAD, P.M.B. 2239, KADUNA, NIGERIA

HIGHER NATIONAL DIPLOMA

IN

ANIMAL HEALTH TECHNOLOGY

CURRICULUM AND COURSE SPECIFICATIONS

JUNE, 2026

PREFACE

The transformation of Nigeria's agricultural sector remains central to the nation's aspirations for sustainable economic growth, food security, job creation, industrial development, and poverty reduction. As agriculture continues to evolve in response to technological advancements, climate change, emerging global market demands, and the need for increased productivity across agricultural value chains, it has become imperative to ensure that curricula in Nigerian tertiary institutions remain relevant, responsive, and aligned with contemporary industry requirements. It is against this backdrop that we embarked on the comprehensive review and modernization of Agricultural curricula for Nigerian tertiary institutions. The review process was designed to address identified skills gaps, integrate emerging technologies and innovations, strengthen entrepreneurship and employability competencies, promote climate-smart agriculture, and align training programmes with the industry expectations and global best practices. The successful execution of this important project was made possible through the invaluable support and commitment of key stakeholders. I wish to express profound appreciation to the Honourable Minister of Education for providing the policy direction and leadership that facilitated this initiative. I also extend sincere gratitude to the Honourable Minister of Agriculture and Food Security and the Honourable Minister of Livestock Development for their unwavering support, technical contributions, and commitment to strengthening agricultural education and workforce development in Nigeria. Special appreciation goes to the Tertiary Education Trust Fund (TETFund) for providing the special intervention grant that enabled the conduct of nationwide skills gap analyses and supported the series of national curriculum review and development workshops. The findings from the skills gap studies provided critical evidence and industry insights that guided the review process and ensured that the curricula reflect current and future workforce requirements within the agricultural sector.

I also acknowledge with gratitude the immense contributions of the Sector Skills Council for Agriculture, whose expertise and industry perspectives greatly enriched the curriculum development process. Equally commendable are the efforts of members of the Implementation Committee, resource persons, industry experts, professional bodies, French Embassy in Nigeria, regulatory agencies, academic institutions, employers, development partners, and other stakeholders who devoted their time, knowledge, and experience to the various workshops and technical sessions. The revised curricula represent a collective national effort to produce graduates equipped with relevant knowledge, practical skills, digital competencies, entrepreneurial capabilities, and professional attitudes required to drive innovation and productivity across Nigeria's agronomy, forestry, fisheries and livestock sectors. It is my expectation that Institutions offering these programmes will faithfully implement the curricula and continue to collaborate with industry to ensure sustained relevance and quality. I commend all stakeholders for their dedication and contributions to this landmark achievement and look forward to the successful implementation of these curricula for the benefit of our dear nation.

Professor Idris M. Bugaje, FNSE
Chairman, Implementation Committee
EXECUTIVE SECRETARY
National Board for Technical Education (NBTE)

ACKNOWLEDGEMENT

The National Board for Technical Education (NBTE) expresses its profound appreciation to all individuals and organizations whose invaluable support, expertise, and commitment made the successful review and modernization of the Agricultural Education curricula for Nigerian tertiary institutions possible. Our sincere gratitude goes to the Honourable Minister of Education for providing the policy direction and leadership that made this national initiative possible. We also appreciate the Honourable Minister of Agriculture and Food Security and the Honourable Minister of Livestock Development for their technical guidance, collaboration, and unwavering commitment to strengthening agricultural education and workforce development in Nigeria. The Board is particularly grateful to the Tertiary Education Trust Fund (TETFund) for providing the special intervention grant that funded the nationwide skills gap analyses, stakeholder engagements, curriculum review exercises, validation meetings, and development workshops. The evidence generated through these studies provided a solid foundation for developing curricula that are relevant, industry-driven, and responsive to national and global agricultural priorities.

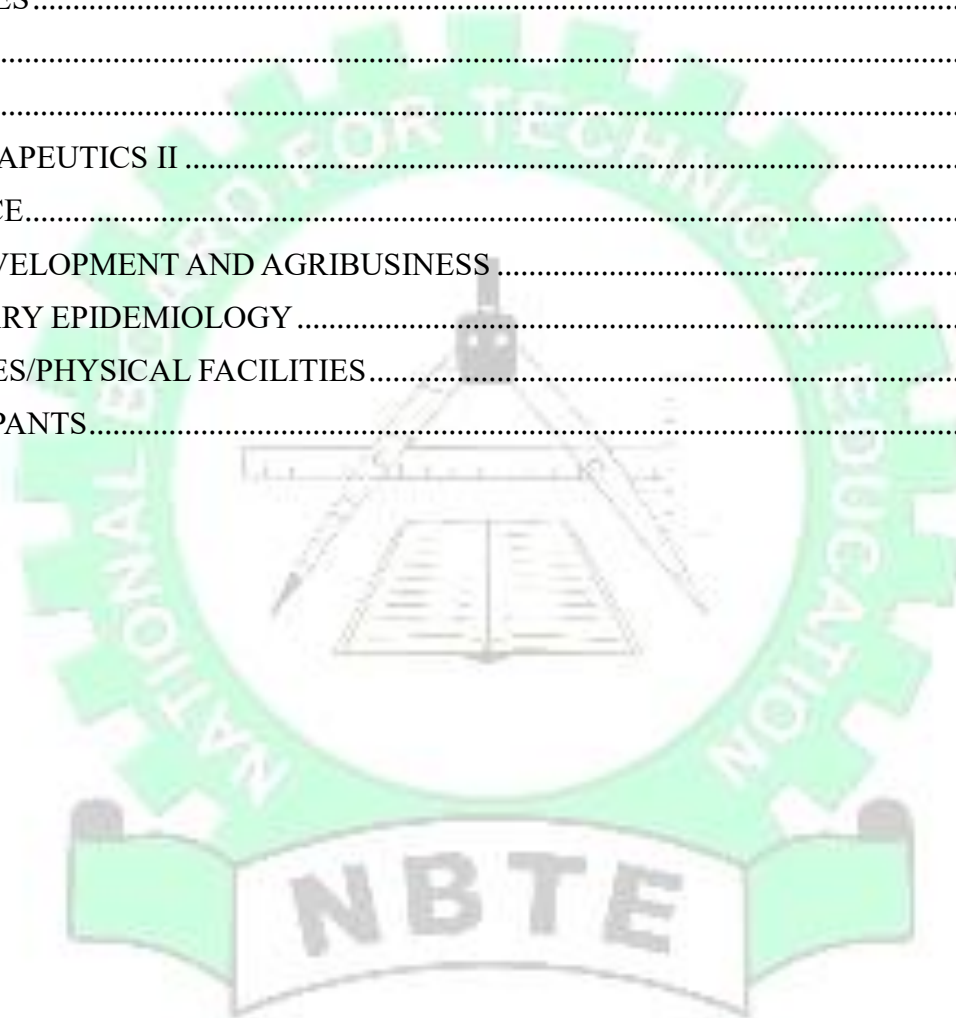
Special appreciation is extended to the curriculum specialists, resource persons, academic experts, professional bodies, regulatory agencies, employers, industry practitioners, development partners, and representatives of public and private sector organizations who participated actively in the skills gap studies, technical sessions, validation exercises, and curriculum development workshops. Their diverse expertise and practical insights greatly enriched the quality and relevance of the curricula. We further appreciate the support of the French Embassy in Nigeria and other development partners for their collaboration in promoting excellence and innovation in technical and vocational education within the agricultural sector. Finally, NBTE expresses its gratitude to all tertiary institutions, researchers, facilitators, rapporteurs, technical staff, and administrative personnel whose commitment and hard work contributed to the successful completion of this important national assignment. The Board acknowledges that this achievement is the result of a collective effort and remains confident that the effective implementation of these curricula will contribute significantly to producing competent, innovative, and entrepreneurial graduates capable of advancing sustainable agricultural development, food security, and economic prosperity in Nigeria.



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GENERAL INFORMATION

1.0 PROGRAMME NOMENCLATURE

Higher National Diploma (HND) in Animal Health Technology.

2.0 PROGRAMME GOAL

The Higher National Diploma in Animal Health Technology programme is designed to produce competent high-level technical manpower equipped with practical skills, scientific knowledge and professional competencies in sustainable Animal Health and certification using climate-smart, environment-friendly and technology-driven agricultural practices for safe Animal Health, agribusiness development and environmental sustainability.

3.0 OBJECTIVES OF THE PROGRAMME

At the end of the Programme, the diplomates should be able to:

- i. Apply the fundamental principles of biochemistry to animal nutrition, physiology, and disease processes;
- ii. Apply principles of genetics, modern animal breeding, and reproductive technologies in poultry breeder bird production;
- iii. Identify the gross anatomical structures of domestic animals and birds;
- iv. Evaluate the roles of microorganisms in veterinary practice and animal health;
- v. Describe and interpret the normal functioning of the body systems of domestic animals and birds;
- vi. Recognize, diagnose, prevent, and control the major diseases of farm animals in Nigeria;
- vii. Identify the microscopic structure of animal tissues and the embryonic development of organs and body systems;
- viii. Assess the general processes of disease development in animals;
- ix. Identify, diagnose, prevent, and control the major parasites affecting farm animals in Nigeria;
- x. Operate feed mills, formulate livestock feeds, and implement feed safety measures;
- xi. Deliver and support livestock extension and advisory services to livestock producers;
- xii. Diagnose, prevent, and control poultry diseases, and apply modern hatchery biosecurity and commercial egg-management practices;
- xiii. Implement and manage animal health service delivery systems and biosecurity zoning programmes;
- xiv. Select, administer, and evaluate veterinary drugs while applying principles of antimicrobial stewardship to reduce antimicrobial resistance (AMR);
- xv. Evaluate and interpret pathological changes in major organ systems of domestic animals and diagnose diseases using gross and microscopic lesions observed at necropsy and biopsy;
- xvi. Apply and manage modern livestock production practices across major species, including swine finishing, digital marketing, machine milking, feedlot operations, neonatal small-ruminant care, and climate-smart livestock production;

- xvii. Manage bee colonies, construct and maintain hives, monitor bee health, conduct queen rearing, and process hive products for commercial production.

4.0 ENTRY REQUIREMENTS

The minimum entry requirements into the HND Animal Health Technology Programme are:

- i) Five (5) O'Level credits in relevant subjects including English Language, Mathematics, Agricultural Science or Biology and one other relevant subject.
- ii) National Diploma (ND) in Animal Health and Production Technology, Veterinary Laboratory Technology or related disciplines with at least Lower Credit;
- iii) Must have undergone one (1) year post-ND industrial training experience;
- iv) Candidates with a **Pass** at the ND Level with two (2) or more years post-ND cognate work experience may be considered for admission.

5.0 STRUCTURE/DURATION OF THE PROGRAMME

The Programme is structured to last for **two (2) academic years (four semesters)** of classroom instruction, laboratory work and field practicals. Each semester shall be for 17 weeks, made up as follows:

- i) 15 contact weeks of teaching (lectures, practicals, fieldwork);
- ii) 2 weeks for tests, registration, and examinations.

6.0 CURRICULUM

The curriculum of the HND Animal Health Technology programme consists of four (4) main components:

- a. General studies/General education courses
- b. Foundation courses
- c. Professional courses
- d. Project work

7.0 STAFFING REQUIREMENTS

7.1 Core Teaching Staff

A minimum of four (4) Core Lecturers who should be Lecturer II and above, with minimum qualification HND/B.Sc./M.Sc. holders in Animal Health Technology, Animal Science, Doctor Veterinary Medicine or related fields.

7.2 Head of Department (HOD)

The Head of Department shall have at least HND or First degree and Master's degree in Animal Science, Doctor Veterinary Medicine or related fields. He or she shall not be below the rank of a Senior Lecturer, must be registered with the relevant professional body and have a minimum of twelve (12) years experience in both academic and industry.

7.3 Technical Staff

There should be technical staff.

i) Technologist

A Technologist is a highly skilled professional trained at the Higher National Diploma (HND) level. They possess advanced technical and practical knowledge in their field and are capable of supervising operations, managing projects, operating modern equipment, and applying technology to solve practical problems. In agriculture, technologists help in farm management, research support, and the application of improved technologies.

ii) Technician

A Technician is a middle-level manpower trained at the National Diploma (ND) level. Technicians are responsible for carrying out technical tasks, operating tools and equipment, and assisting technologists and professionals in practical activities. In agriculture, they assist in crop production, livestock management, farm maintenance, and data collection.

iii) Farm Assistants

Farm assistants are support workers who help in daily farm operations under supervision. They perform basic practical activities such as planting, weeding, feeding animals, harvesting, cleaning farm tools, and maintaining farm records. They contribute to the smooth running of farm activities and help improve productivity.

8.0 CERTIFICATION

A diplomate of this programme shall be awarded the Higher National Diploma (HND) in Animal Health Technology.

9.0 AWARD OF HIGHER NATIONAL DIPLOMA (HND)

The Higher National Diploma in Animal Health Technology shall be awarded by the authority of the Academic Board of the institution under the following conditions:

- i) Satisfactory performance in all prescribed course work/assignments, tests/quizzes, workshop practice, laboratory work, field trips, etc.;
- ii) Satisfactory performance in all semester examinations;
- iii) Satisfactory completion of written project/seminar papers.

9.1 Conditions for the Award of HND:

Institutions offering accredited programmes will award the Higher National Diploma to candidates who successfully completed the programme after passing the prescribed course-work, examinations, diploma project etc. Courses shall be graded as follows:

MARKS RANGE	LETTER GRADE	WEIGHTING
75% and above	A	4.00
70% – 74%	AB	3.50
65% – 69%	B	3.25
60% – 64%	BC	3.00
55% – 59%	C	2.75
50% – 54%	CD	2.50
45% – 49%	D	2.25
40% – 44%	E	2.00
Below 40%	F	0.00

9.2 Classification of Diplomas:

Diploma Certificates shall be awarded based on the following classifications:

CGPA	CLASS OF DIPLOMA
CGPA 3.50 and above	Distinction
CGPA 3.00-3.49	Upper Credit
CGPA 2.50-2.99	Lower Credit
CGPA 2.00-2.49	Pass

10.0 ACCREDITATION OF PROGRAMME

The Higher National Diploma (HND) in Animal Health Technology shall be accredited by the NBTE before the diplomates are awarded the certificates. Details about the process of accrediting a programme for the award of HND are available from the Board's website web.nbte.gov.ng or through correspondence to: The Executive Secretary, NBTE, Plot 'B' Bida Road, P.M.B 2239, Kaduna, Nigeria.

11.0 LOGBOOK

A personal logbook for each course is to be kept by the students. It shall contain all the recordings of the day-to-day, weekly and semester practical works/activities from day one to the end of the programme. This is to be checked, marked appropriately and endorsed by all lecturers concerned at the end of every week.

12.0 FINAL YEAR PROJECTS

Final year students are expected to carry out project work, either on individual or group basis (not more than 2 per group). The project topics should as much as possible be related to the programme and serve as useful tools for further Research and /or Development. Projects should be

properly supervised, and their reports well presented. The Institution should develop formats for presenting and grading projects. The formats should be adopted as applied to each stakeholder.

13.0 GUIDANCE NOTES FOR TEACHERS OF THE PROGRAMME

13.1 The new curriculum is drawn in unit courses. This is in keeping with the provisions of the National Policy on Education which stress the need to introduce the semester credit units which will enable a student, who so wishes, to transfer the units already completed in an institution of similar standard from which he/she is transferring.

13.2 In designing the units, the principle of the modular system by product has been adopted, thus making each of the professional modules, when completed provides the student with technician operative skills, which can be used for employment purposes.

13.3 As the success of the credit unit system depends on the articulation of programmes between the institution and industry, the Curriculum content has been written in behavioral objectives, so that the expected performance of the student is clear to all students who successfully completed some of the courses or the diplomates of the programme. There is a slight departure in the presentation of the performance-based curriculum which requires the conditions under which the performance is expected to be carried out and the criteria for the acceptable levels of performance. It is a deliberate attempt to further involve the staff of the department teaching the programme to write their own curriculum stating the conditions existing in their institution under which the performance can take place and follow that with the criteria for determining an acceptable level of performance. Departmental submission on the final curriculum may be vetted by the Academic Board of the institution. Our aim is to continue to see to it that a solid internal Evaluation system exists in each institution for ensuring minimum standard and quality of education in the programmes offered throughout the polytechnic system.

13.4 The teaching of theory and practical work should, as much as possible, be integrated. Practical exercises, especially those in professional courses and laboratory work should not be taught in isolation from the theory.

14.0 GUIDELINES ON MANDATORY SKILLS QUALIFICATIONS (MSQ)

Please, refer to NBTE guidelines for implementation of MSQ in Polytechnics. This can be downloaded from NBTE website (web.nbte.gov.ng)

CURRICULUM TABLE**YEAR I SEMESTER I**

S/N	COURSE CODE	COURSE TITLE	L	T	P	CU	CH
1.	GNS 301	Use of English III	2	0	0	2	2
2.	MSQ 311	Principles of Quality Assurance Assessment	1	0	1	2	2
3.	APT311	Introduction to Biochemistry	1	0	3	4	4
4.	ANH 311	Genetics and Animal Breeding	1	0	3	4	4
5.	ANH 312	Gross Anatomy	1	0	3	4	4
6.	ANH 313	Veterinary Microbiology	1	0	3	4	4
7.	ANH 314	Veterinary Physiology	1	0	3	4	4
8.	ANH 315	Farm Animal Diseases	1	0	3	4	4
9.	ANH 316	General Livestock Production	1	0	3	4	4
TOTAL			10	0	22	32	32

YEAR I SEMESTER II

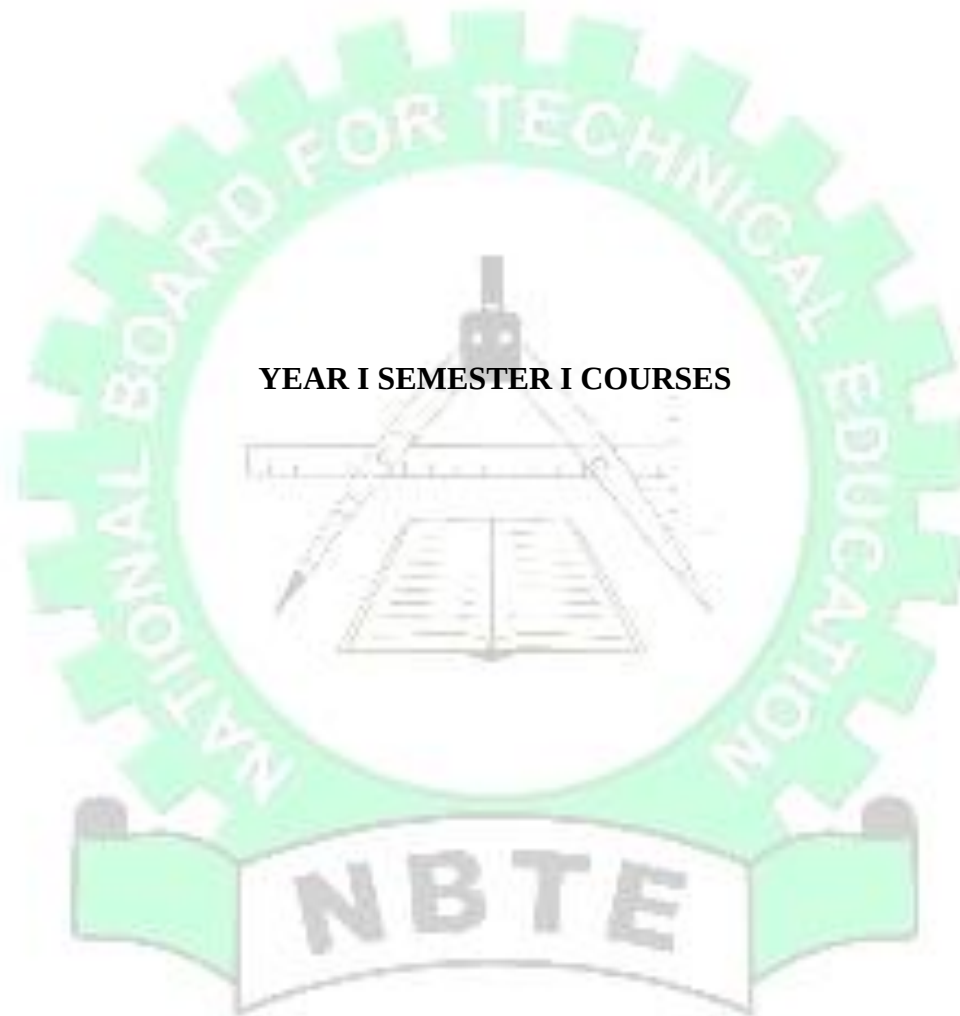
S/N	COURSE CODE	COURSE TITLE	L	T	P	CU	CH
1.	GNS 302	Communication in English III	2	0	0	2	2
2.	ENT 326	Practice of Entrepreneurship I	1	0	2	3	3
3.	MSQ 321	Practice of Quality Assurance assessment	1	0	1	2	2
4.	AGR 301	Farm Management	2	0	0	2	2
5.	AGR 303	Field Experimentation and Data Analysis	1	0	1	2	2
6.	APT 320	Computer Application in Animal Production	1	0	2	3	3
7.	ANH 321	Histology and Embryology	1	0	3	4	4
8.	ANH 322	General Pathology	1	0	3	4	4
9.	ANH 323	Farm Animal Parasitology I	1	0	3	4	4
10.	ANH324	Agricultural Biochemistry	1	0	2	3	3
11.	ANH 325	Applied Animal Nutrition and Feed Safety	1	0	3	4	4
12.	ANH 326	Livestock Extension and Digital Advisory Services	1	0	2	3	3
TOTAL			14	0	22	36	36

YEAR II SEMESTER I

S/N	COURSE CODE	COURSE TITLE	L	T	P	CU	CH
1.	GNS 401	Communication in English	2	0	0	2	2
2.	ENT 416	Practice of Entrepreneurship II	2	0	2	4	4
3.	AGR 401	Research Methodology and Scientific Writing	1	0	1	2	2
4.	APT 412	Pasture and Range Management II	1	0	3	4	4
5.	ANH 411	Poultry Diseases, Biosecurity and Hatchery Operations	1	0	2	3	3
6.	ANH 412	Clinical Techniques I	1	0	3	4	4
7.	ANH 413	Veterinary Parasitology II	1	0	3	4	4
8.	ANH 414	Pharmacology and Therapeutics I	1	0	2	3	3
9.	ANH 415	Systemic Pathology	1	0	2	3	3
10.	ANH 416	Introduction to Apiculture and Hive Products	1	0	2	3	3
TOTAL			12	0	20	32	32

YEAR II SEMESTER II

S/N	COURSE CODE	COURSE TITLE	L	T	P	CU	CH
1.	AED 424	Rural Sociology	1	0	1	2	2
2.	APT 424	Animal Products Processing and Hygiene	1	0	3	4	4
3.	ANH 421	Veterinary Toxicology	1	0	2	3	3
4.	ANH 422	Clinical Techniques II	1	0	3	4	4
5.	ANH 423	Pharmacology and Therapeutics II	1	0	2	3	3
6.	ANH 424	Veterinary Jurisprudence	1	0	0	1	1
7.	ANH 425	Livestock Enterprise Development and Agribusiness	1	0	2	3	3
8.	ANH 426	One Health, Anti-Microbial Resistance Stewardship and Veterinary Epidemiology	2	0	1	3	3
9.	ANH 427	Seminar	0	0	1	1	1
10.	ANH 428	Final Project	0	0	4	4	4
TOTAL			9	0	19	28	28



GENETICS AND ANIMAL BREEDING

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: GENETICS AND ANIMAL BREEDING	COURSE CODE: ANH 311	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of genetics and modern animal breeding, including reproductive technologies for poultry breeder birds.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand the principles of genetics; 2.0 Understand Mendelian and population genetics; 3.0 Understand quantitative and qualitative genetics in animals; 4.0 Understand animal-breeding systems; 5.0 Understand modern reproductive technologies; 6.0 Know the use of AI in poultry breeder birds.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: GENETICS AND ANIMAL			COURSE CODE: ANH 311		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of genetics and modern animal breeding, including reproductive technologies for poultry breeder birds.						
GENERAL OBJECTIVE 1.0: Understand the principles of genetics						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Define genetics and its key terms. 1.2 Explain chromosomes and genes. 1.3 Explain mitosis and meiosis.	• Explain genetics and its key terms. • Describe chromosomes and genes. • Describe mitosis and meiosis.	Charts of chromosomes, models, projector, White Board, Marker.	• Prepare karyotype slides of different species • Identify the diploid number, sex chromosomes and any visible abnormalities. • Prepare an onion root-tip squash to observe mitotic stages, • Identify prophase, metaphase, anaphase and telophase under the microscope. • Draw a typical metaphase chromosome in the logbook.	Guide students to: • Prepare karyotype slides of different species • Identify the diploid number, sex chromosomes and any visible abnormalities. • Prepare an onion root-tip squash to observe mitotic stages, • Identify prophase, metaphase, anaphase and telophase under	Microscopes, karyotype slides, onion roots, acetocarmine, slides, Logbook, PPE

					the microscope. Draw a typical metaphase chromosome in the Logbook,	
General Objective 2.0: Understand Mendelian and population genetics						
3-5	2.1 Explain Mendel's laws of segregation and independent assortment. 2.2 Explain the Punnett square method for predicting offspring genotypes and phenotypes. 2.3 Explain population genetics through the Hardy-Weinberg equation. 2.4 Explain the five assumptions of Hardy-Weinberg equilibrium.	• Discuss Mendel's laws of segregation and independent assortment. • Explain the Punnett square method for predicting offspring genotypes and phenotypes. • Explain population genetics through the Hardy-Weinberg equation. • Explain the five assumptions of Hardy-Weinberg equilibrium.	Charts, worksheets, calculator, Projector, Whiteboard, Reference Materials, Lecture Notes	• Solve genetics problems including allele-frequency calculations.	Guide Students to: • Provide a problem set covering monohybrid, dihybrid and Hardy-Weinberg problems, • Review workings, and answers in a class plenary.	Problem sheets, worked examples, calculators.
General Objective 3.0: Understand quantitative and qualitative genetics in animals						
6-7	3.1 Explain qualitative and quantitative traits.	• Distinguish qualitative traits and	Charts, heritability	• Compute selection differential and	Guide students to: • Compute mean,	Sample herd data,

	3.2 Explain heritability. 3.3 Describe selection methods.	quantitative traits • Explain economically important traits. • Discuss heritability • Discuss selection method using Nigerian breeding station.	tables, projector, white board, Lecture notes	expected genetic gain. • Interpret the results.	selection differential and expected response ($R = h^2 \times S$ from trait data for a sample herd. • Interpret the results.	worksheets, calculator, Logbook.
General Objective 4.0: Understand animal-breeding systems						
8-9	4.1 Explain inbreeding and outbreeding. 4.2 Describe crossbreeding and grading-up. 4.3 Explain selection programmes.	• Explain inbreeding and outbreeding • Explain cross breeding and grading-up. • Explain how a structured selection programme is designed.	Charts, pedigree diagrams, projector.	• Compute the inbreeding coefficient using the path-counting method • Design a crossbreeding scheme for a chosen production goal.	Guide Students to; • Compute the inbreeding coefficient using the path-counting method • Design a crossbreeding scheme for a chosen production goal.	Pedigree templates, worksheets, calculator.
General Objective 5.0: Understand modern reproductive technologies						
10-11	5.1 Describe the Artificial Insemination (AI) procedure in cattle and small ruminants 5.2 Explain the impact of AI on livestock improvement in Nigeria. 5.3 Outline embryo transfer 5.4 Explain genomic selection	• Discuss the Artificial Insemination (AI) procedure in cattle and small ruminants • Discuss the impact of AI on livestock improvement in Nigeria.	AI equipment, charts, projector, white board, reference materials.	• Evaluate collected semen under the microscope. • Process preserve semen. • Conduct AI in some livestock species.	Guide students to: • Collect and evaluate semen under the microscope • Process and preserve semen • Conduct AI in some livestock	Microscope, semen samples, slides, extender, semen-evaluation chart, artificial vagina/electro

	as the use of SNP-based markers to estimate breeding values early in life. 5.5 State its emerging application in Livestock breeding.	• Outline embryo transfer • Explain genomic selection as the use of SNP-based markers to estimate breeding values early in life • Explain emerging application in Livestock breeding.			species.	-ejaculator, LN Canister, egg yolk, Distilled water, pH meter AI kits. Live Animals
General Objective 6.0: Know the use of AI in poultry breeder birds						
12-15	6.1 Explain the rationale for poultry AI. 6.2 Describe semen collection in broiler breeder males. 6.3 Describe insemination in hens. 6.4 State biosecurity protocols for poultry AI.	• Explain the rationale for poultry AI. • Explain semen collection in breeder males. • Explain insemination in hens. • Outline biosecurity protocols for poultry AI.	Charts, videos, AI equipment, projector.	• Evaluate collected semen under the microscope. • Process preserve semen • Conduct AI in some poultry species,	Guide students to: • Collect and evaluate semen under the microscope • Process and preserve semen • Conduct AI in some poultry species,	Breeder males and hens, semen collection tube, microscope, slides, extender, insemination syringes, PPE, candler.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

GROSS ANATOMY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: GROSS ANATOMY	COURSE CODE: ANH 312	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to enable students with knowledge of the gross anatomical structure of domestic animals and birds.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Know the topographical and other descriptive terms used in gross anatomy; 2.0 Know the structure of the skin, hoof and feather; 3.0 Know the structure of bones of different animals and birds; 4.0 Understand articulation of bones and the importance of joints; 5.0 Understand types of muscles in the body of mammals and avians and their functions; 6.0 Know the digestive systems of animals and avians; 7.0 Know the respiratory system of mammals and avians; 8.0 Know the cardiovascular system of mammals and avians; 9.0 Know the structure of urinary systems of mammals and avians; 10.0 Know the structure of the nervous system; 11.0 Know the structures of the eyes and ears of mammals and avians.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: GROSS ANATOMY			COURSE CODE: ANH 312		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to enable students with knowledge of the gross anatomical structure of domestic animals and birds.						
GENERAL OBJECTIVE 1.0: Know the topographical and other descriptive terms used in gross anatomy						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1	1.1 Define Anatomy 1.2 Identify the branches of Anatomy. 1.3 List the Principal methods of studying anatomy e.g. systematic and topographical methods. 1.4 Define descriptive and topographical terms.	• Explain Anatomy and its branches. • Enumerate the Principal methods of studying anatomy e.g. systematic and topographical methods. • Explain descriptive and topographical terms.	Whiteboard, charts, models, anatomical posters, projector.	• Identify topographical terms on live animal/cadavers. • Illustrate various descriptive terms using charts and posters.	Guide students to • Identify topographical terms on live animal/cadavers • Illustrate various descriptive terms.	Live Animal/cadaver, drawing materials.
General Objective 2.0: Know the structure of the skin, hoof and feather						
2	2.1 Define the integumentary system 2.2 Outline its importance to animals.	• Explain the integumentary system • Explain its	Whiteboard, charts, models, anatomical posters,	• Identify different integumentary structures • Draw well labelled	Guide students to: • Identify different integumentary structures,	Drawing materials, Live Animal/Cad

	2.3 Describe the different types of feathers and relate their structure to functions.	importance to animals. • Explain the different types of feathers and relate their structure to functions.	projector.	different integumentary structures	• Draw and label different integumentary structures	aver
General Objective 3.0: Know the structure of bones of different animals and birds						
3	6.1 Describe the composition of the skeleton 6.2 List the classification of bones according to their gross appearance and functions. 6.3 Outline the general functions of bones. 6.4 List the divisions of the skeleton. 6.5 Describe the axial skeleton and its constituents 6.6 Describe the appendicular skeleton.	• Explain the composition of the skeleton • Explain the classification of bones according to their gross appearance and functions. • Explain the general functions of bones. • Explain the divisions of the skeleton. • Explain the axial skeleton and its constituents • Explain the appendicular skeleton.	Whiteboard, charts, anatomical posters, projector, internet.	• Identify all bones of the axial and the appendicular skeleton of livestock. • Draw all bones of the axial and the appendicular skeleton of Livestock.	Guide students to: • Identify all bones of the axial and the appendicular skeleton of livestock. • Draw all bones of the axial and the appendicular skeleton of Livestock.	Chicken and goat/rabbit cadavers, dissection kits, formalin, charts.
General Objective 4.0: Understand articulation of bones and the importance of joints						

4-5	4.1 Define arthrology. 4.2 Explain joints based on the mode of development. 4.3 Describe a typical diarthrodial joint. 4.4 Explain the articulation of the appendicular skeleton using common and technical terms e.g. joints. 4.5 Describe the articulation of the axial skeleton. 4.6 Explain the degree of freedom or movement in relation to its function. 4.7 Explain the condition that can cause dysfunction of joints.	• Explain arthrology. • Explain joints based on the mode of development. • Discuss a typical diarthrodial joint. • Explain the articulation of the appendicular skeleton using common and technical terms e.g. joints. • Explain the articulation of the axial skeleton. • Explain the degree of freedom or movement in relation to its function. • Explain the condition that can cause dysfunction of joints.	Whiteboard, charts, anatomical posters, projector.	• Identify different types of joints in mammals and birds. • Draw different types of joint in mammals and Birds with appropriate labels. • Compare different joints	Guide students to: • Identify different types of joints in mammals and birds • Draw, label different types of joint in mammals and Birds • Compare different joints	Skeletal, drawing materials
General Objective 5.0: Understand types of muscles in the body of mammals and avian and their functions						
6	5.1 Define myology. 5.2 Explain muscle shape in relation to function. 5.3 Explain “origin” and “insertion” and the	• Explain myology. • Describe muscle shape in relation to function.	Projector, white marker board,	• Dissect heart and kidney. • Identify all major structures.	Guide students to: • Dissect heart and kidney • Identify major	Models Charts Dissecting kit Goats,

	importance of each term. 5.4 Explain the structure of extensor, flexor, adductor and abductor muscles. 5.5 Explain the major muscles of different parts of the body	- Describe “origin” and “insertion” and the importance of each term. - Describe the structure of extensor, flexor, adductor and abductor muscles. - Describe the major muscles of different parts of the body		Draw well labelled muscles of the body with particular	muscles of different parts of the body (face, neck, thorax, abdomen, talc and limbs) e.g. massager muscle. Draw and label muscles of the body with particular emphasis on muscles of locomotion (mammals) and flight (avians)	chickens pigs and rabbits cadavar chamber and formalin.
General Objective 6.0: Know the digestive systems of animals and Avian						
7-8	6.1 Explain the mouth and tongue of different animals. 6.2 Explain the dental formula of different animals. 6.3 Describe dentition to food and feeding habits of different animals. 6.4 Explain dentition in relation to age. 6.5 Explain the ruminant, pseudo- ruminant, monogastric and avian	- Examine the mouth and tongue of different animals. - Describe the dental formula of different animals. - Discuss dentition to food and feeding habits of different animals. - Describe dentition in relation to age. - Describe the ruminant, pseudo-	Projector, white marker board,	- Identify accessory digestive organs - Draw the internal and accessory organs and explain the differences in the alimentary canal of different mammals and avian. - Draw a well labelled digestive system of a typical mammal and avian.	Guide students to: - Identify accessory digestive organs - Draw and label the internal and accessory organs and explain the differences in the alimentary canal of different mammals and avian. - Draw and label	Preserved specimen of different GITs, models, Charts, dissecting kits, PPE

	gastrointestinal structures. 6.6 Explain the digestive system of different mammals and avian to their food and feeding habit. 6.7 Explain the structure of the digestive system of different mammals and avian.	ruminant, monogastric and avian gastrointestinal structures. Describe the digestive system of different mammals and avian to their food and feeding habit. Describe the structure of the digestive system of different mammals and avian.			the digestive system of a typical mammal and avian.	
General Objective 7.0: Know the respiratory system of mammals and avian						
9	7.1 Describe the parts of respiratory system of different mammals and avians 7.2 Describe the parts of respiratory system of different mammals and avians in relation to their functions. 7.3 Differentiate between the lungs of different animals using various parameters.	- Explain the parts of respiratory system of different mammals and avians - Explain the parts of respiratory system of different mammals and avians in relation to their functions. - Distinguish between the lungs of different animals using various parameters.	Projector, white marker board	- Identify the parts of different respiratory systems - Compare foetal and adult lungs in mammals and avian. - Compare the avian respiratory structures with those of mammals. - Dissect the respiratory system of a typical mammal and avian. - Draw a well labeled diagram of dissected respiratory system of a	Guide students to: - Identify the parts of different respiratory systems - Compare foetal and adult lungs in mammals and avian. - Compare the avian respiratory structures with those of mammals. - Dissect, draw and label the parts of	Preserved specimen of different respiratory tracts, models, Charts, dissecting kits, PPE

				typical mammal and avian.	the respirator system of a typical mammal and avian.	
General Objective 8.0: Know the cardio vascular system of mammals and avian						
10	8.1 Describe the parts of mammalian and avian hearts 8.2 Differentiate mammalian heart from that of avian. 8.3 Describe the location of the heart in different animal species. 8.4 Describe the different types of blood vessels and their functions. 8.5 Describe the major branches of the aorta and the venae cavae. 8.6 List the phlebotomy sites 8.7 List the major lymph nodes in the body (internal and superficial). 8.8 Explain lymphoid tissue and lacteals.	- Outline the parts of mammalian and avian hearts - Distinguish mammalian heart from that of avian. - Discuss the location of the heart in different animal species. - Discuss the different types of blood vessels and their functions. - Explain the major branches of the aorta and the venae cavae. - State the phlebotomy sites - Enumerate the major lymph nodes in the body (internal and superficial).	Projector, white marker board, lecture notes	- Dissect birds to locate the heart. - Identify the different types of blood vessels and their functions e.g. arteries and veins. - Create visual content to relate the structure of the vessels in above to the functions they perform. - Identify phlebotomy sites.	Guide students to: - Dissect birds to locate the heart. - Identify the different types of blood vessels and their functions e.g. arteries and veins. - Relate the structure of the vessels in above to the functions they perform. - Identify phlebotomy sites	Preserved specimen of different hearts, models, Charts, dissecting kits, phlebotomy tools, PPE

		• Discuss lymphoid tissue and lacteals.				
General Objective 9.0: Know the structure of the urinary systems of mammals and avians.						
11-12	9.1 Explain the components of the urinary system of different mammals and avians 9.2 Explain how the structures are adopted to efficient performance of the function. 9.3 Explain the differences between the urinary systems of various mammals and avian. 9.4 Describe the genital systems of mammals and avians of different sexes 9.5 Outline the structures of the various genital system in mammals and avian	• Explain the components of the urinary system of different mammals and avians • Explain how the structures are adopted to efficient performance of the function. • Explain the differences between the urinary systems of various mammals and avian. • Discuss the genital systems of mammals and avians of different sexes • Discuss the structures of the various genital system in mammals and avian.	Projector, white marker board, lecture notes	• Identify the different component of the urinary tracts • Draw a well labelled the organs of the urinary system of various mammals and avian. • Identify the differences between the urinary systems of various mammals and avian. • Identify the genital systems of mammals and avian of different sexes. • Identify the component parts of the genital system of mammals and avian. • Create presentation on slides to relate the structures of the various genital system in mammals and avian	Guide students to: • Identify the different component of the urinary tracts • Draw and label the organs of the urinary system of various mammals and avian. • Identify the differences between the urinary systems of various mammals and avian. • Identify the genital systems of mammals and avian of different sexes. • Identify the component parts of the genital system of mammals and avian.	Preserved specimen of different urogenital, models, Charts, dissecting kits, PPE

					• Relate the structures of the various genital system in mammals and avian	
General Objective 10.0: Know the structures of the nervous and sensory systems						
13-14	10.1 Explain the nervous system. 10.2 Explain parts of the nervous system and, autonomic nervous system. 10.3 Explain the various parts in nervous system and, autonomic nervous system 10.4 Explain the meninges, brain and spinal cord. 10.5 Differentiate between the spinal and cranial nerves 10.6 Define aesthesiology.	• Explain the nervous system. • Outline the parts of the nervous system and, autonomic nervous system. • Explain the various parts in nervous system and, autonomic nervous system • Explain the meninges, brain and spinal cord. • Differentiate between the spinal and cranial nerves • Explain aesthesiology. • Discuss the structure of the mammalian eye and compare with that of avian.	Chart, Projector, White Board, Marker, Internet, Digital Information	• Identify the eye and its location. • Identify the ear of mammals and compare with that of avian. • Draw a well labelled the parts of the eye of mammals and avian. • Draw parts of the inner and outer ear of mammals and avian with appropriate labels.	Guide students to: • Identify the eye and its location. • Identify the ear of mammals and compare with that of avian. • Draw and label the parts of the eye of mammals and avian. • Draw and label the parts of the inner and outer ear of mammals and avian.	Preserved specimen of different animal heads, models, Charts, PPE

		• Explain the ear of mammals and compare with that of avian. • Explain the structure of the parts of the ear in relation to percussion, perception and balance				
General Objective 11.0: Know the structures of the Eyes and Ear of Mammals and Avians.						
15	11.1 Explain the structure of the mammalian eye and compare with that of avian. 11.2 Describe the ear of mammals and compare with that of avian. 11.3 Explain the structure of the parts of the ear in relation to percussion, perception and balance.	• Discuss the structure of the mammalian eye and compare with that of avian. • Discuss the ear of mammals and compare with that of avian. • Describe the structure of the parts of the ear in relation to percussion, perception and balance	Chart, Projector, White Board, Marker, Internet, Digital Information	• Identify the eye and its location. • Identify the ear of mammals and compare with that of avian. • Draw and label the parts of the eye of mammals and avian. • Draw and label the parts of the inner and outer ear of mammals and avian.	Guide students to; • Identify the eye and its location. • Identify the ear of mammals and compare with that of avian. • Draw and label the parts of the eye of mammals and avian. • Draw and label the parts of the inner and outer ear of mammals and avian.	Preserved specimen of different animal heads, models, Charts, PPE

COURSE ASSESSMENT:

Course work: 10%

Test/Assignments: 10%

Practical 40%

Examination: 40%

Total: 100%



VETERINARY MICROBIOLOGY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: VETERINARY MICROBIOLOGY	COURSE CODE: ANH 313	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of the roles of microorganisms in veterinary practice.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand bacterial growth and multiplication; 2.0 Understand systematic bacteriology; 3.0 Understand the nature of viruses; 4.0 Understand fungi of veterinary importance; 5.0 Understand the immune system; 6.0 Understand vaccines and the vaccine cold-chain; 7.0 Understand Collection, preservation and submission of microbiological specimens.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: VETERINARY MICROBIOLOGY			COURSE CODE: ANH 313		CONTACT HOURS: 3 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of the roles of microorganisms in veterinary practice.						
GENERAL OBJECTIVE 1.0: Understand bacterial growth and multiplication						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Explain bacterial morphology and structure. 1.2 Explain bacterial growth requirements. 1.3 Explain phases of growth. 1.4 Explain culture media.	- Describe bacterial morphology and structure. - Explain bacterial growth requirements. - Outline phases of growth. - Describe different types of culture media.	Projector, white marker board, lecture notes.	- Identify different types of bacteria using compound microscope from prepared slide, - Identify at least three prepared slides and sketch what they observe. - Conduct smear preparation and heat fixation on a glass slide, - Prepare their own smear from a bacterial culture and view it under oil immersion after Gram staining.	Guide students to; - Identify different types of bacteria using compound microscope from prepared slide, - Identify at least three prepared slides and sketch what they observe. - Conduct smear preparation and heat fixation on a glass slide, - Prepare their own smear from a bacterial culture and view it under oil immersion after Gram	Microscopes, prepared slides, slide rack, immersion oil, bacterial cultures, glass slides, staining materials,

					staining.	
General Objective 2.0: Understand systematic bacteriology						
3-5	2.1 Explain major Gram-positive bacteria of veterinary importance. 2.2 Explain major Gram-negative bacteria. 2.3 Describe acid-fast and spore-forming bacteria. 2.4 Explain higher bacteria	• Discuss e major Gram-positive bacteria of veterinary importance. • Discuss major Gram-negative bacteria. • Discuss acid-fast and spore-forming bacteria. • Discuss higher bacteria	Projector, white marker board, lecture notes	• Carry out Gram staining step by step • Carry out Ziehl-Neelsen acid-fast staining • Prepare culture media. • Identify colonial morphology on different culture media	Guide students to; • Conduct Gram staining step by step • Conduct Ziehl-Neelsen acid-fast staining • Prepare culture media. • Identify colonial morphology on different culture media	Gram stains, ZN stains, microscopes, bacterial cultures, agar plates petri dish, assorted media based.
General Objective 3.0: Understand the nature of viruses						
6-7	3.1 Explain virus structure and classification. 3.2 Outline viral replication. 3.3 List major viruses of veterinary importance.	• Describe virus structure and classification • Outline viral replication. • Enumerate major viruses of veterinary importance.	Projector, white marker board, lecture notes	• Identify cytopathic effects (CPE) in cell culture, • Carry out various serological test for detecting viruses	Guide student to; • Identify cytopathic effects (CPE) in cell culture, • Conduct various serological test for detecting viruses	Microtitre plates, ND antigen, chicken RBCs, micropipettes, charts, cell line.
General Objective 4.0: Understand fungi of veterinary importance						
8	4.1 Describe fungal structure. 4.2 Classify fungi based on their location	• Explain fungal structure. • Discuss fungi	Projector, white marker board, lecture	• Conduct the collection of skin scrapings from a	Guide students to; • Conduct the collection of skin	Microscopes, KOH, slides, Sabouraud

	4.3 List dermatophytes, yeasts and systemic fungi.	based on their location Enumerate dermatophytes, yeasts and systemic fungi.	notes.	suspected case, - Conduct wet-mount preparation, and microscopic examination for hyphae and spores - Prepare Sabouraud agar plates for fungal culture - Identify colony morphology on the agar plate. - Conduct wet mount from the culture media, - Identify the conidiophore structure under microscope.	scrapings from a suspected case, - Conduct wet-mount preparation, and microscopic examination for hyphae and spores - Prepare Sabouraud agar plates for fungal culture - Identify colony morphology on the agar plate. - Conduct wet mount from the culture media, - Identify the conidiophore structure under microscope.	plates with cultures, lactophenol cotton blue.
General Objective 5.0: Understand the immune system						
9-10	5.1 Explain innate and adaptive immunity. 5.2 Describe antibody and cell-mediated responses. 5.3 Explain hypersensitivity reactions.	- Distinguish innate and adaptive immunity. - Describe antibody and cell-mediated responses. - Describe hypersensitivity reactions.	Charts, projector, immunology textbook.	Perform an agglutination test for blood typing or serology.	Guide students to; - Conduct tube/slide agglutination test. - Conduct the test on serum samples and read results.	Antigens, sera, slides, plates, charts, test tubes.
GENERAL OBJECTIVE 6.0: Understand vaccines and the vaccine cold-chain						

11-12	6.1 Explain vaccines. 6.2 Describe vaccine administration routes. 6.3 Describe the vaccine cold-chain (Modernised).	• Discuss the classification of vaccines. • Explain vaccine administration routes. • Explain the vaccine cold-chain (Modernised).	Textbooks, projector, whiteboard, charts, temperature data-loggers.	• Carry out vaccine packaging in the ice pack • Monitor vaccine cold chain to identify any temperature breaches.	Guide students to; • Conduct vaccine packaging in the ice pack • Monitor vaccine cold chain to identify any temperature breaches.	Cold boxes, ice packs, vaccine vials, temperature data-loggers, computer.
GENERAL OBJECTIVE 7.0: Collect and Submit Microbiological Specimens						
13-15	7.1 Describe sample collection methods. 7.2 Describe sample preservation and transport. 7.3 Describe sample processing methods	• Discuss microbiological sample collection methods. • Explain sample preservation and transport. • Discuss sample processing methods	Textbooks, projector, whiteboard, charts, temperature data-loggers.	• Collect blood, swab and tissue samples from a live animal or at post-mortem. • Label correctly, package for transport, • Complete the laboratory request form.	Guide student to; • Collect blood, swab and tissue samples from a live animal or at post-mortem. • Label correctly, package for transport, • Complete the laboratory request form.	Sampling kits, transport media, request forms, cool boxes.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

VETERINARY PHYSIOLOGY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: VETERINARY PHYSIOLOGY	COURSE CODE: ANH 314	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of the normal functioning of different body systems of domestic animals and birds.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand cutaneous and musculoskeletal physiology; 2.0 Understand the digestive system; 3.0 Understand respiratory and cardiovascular physiology; 4.0 Understand the urinary system; 5.0 Understand reproduction; 6.0 Understand the endocrine, nervous and sensory systems.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: VETERINARY PHYSIOLOGY			COURSE CODE: ANH 314		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of the normal functioning of different body systems of domestic animals and birds.						
GENERAL OBJECTIVE 1.0: Understand cutaneous and musculoskeletal physiology						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Explain functions of the skin. 1.2 Explain bone and muscle physiology. 1.3 Explain thermoregulation mechanism.	• Discuss functions of the skin. • Describe bone and muscle physiology. • Explain thermoregulation mechanism	Charts, models, projector, Lecture notes	• Demonstrate the correct use of a digital thermometer rectally in cattle and small ruminants and cloacally in chickens • Take temperatures of at least three animals. • Compare accorded values against species reference ranges.	Guide students to; • Demonstrate the correct use of a digital thermometer rectally in cattle and small ruminants and cloacally in chickens, • Take and record temperatures of at least three animals, comparing values against species reference ranges	Digital thermometers, restraint equipment, animals, recording sheets, PPE.
General Objective 2.0: Understand the physiology of the digestive system						

3-5	2.1 Explain digestion in monogastrics 2.2 Describe digestion in ruminant animals. 2.3 Describe the absorption process. 2.4 Differentiate avian digestion from that of ruminant.	- Describe digestion in monogastrics - Explain digestion in ruminant animals. - Explain the absorption process. - Distinguish avian digestion from that of ruminant.	Charts, whiteboard, marker, internet projector.	- Collect rumen fluid via stomach tube/fistulated animal (or fresh slaughter sample), - Measure pH using a pH meter or strips, - Identify rumen microbes under the microscope. - Conduct palpation to detect rumen motility. - Count and time rumen contractions.	Guide students to; - Collect rumen fluid via stomach tube/fistulated animal (or fresh slaughter sample), - Measure pH using a pH meter or strips, - Examine rumen microbes under the microscope. - Conduct palpation to detect rumen motility. - Count and time rumen contractions.	Rumen fluid, stomach tube, pH meter/strips, microscopes, live ruminant, PPE
General Objective 3.0: Understand respiratory and cardiovascular systems physiology						
6-8	3.1 Describe respiratory mechanics. 3.2 Explain gas exchange and transport. 3.3 Describe the cardiac cycle and ECG. 3.4 Describe blood and haemostasis.	- Explain respiratory mechanism. - Explain gas exchange and transport. - Explain the cardiac cycle and ECG. - Explain blood and haemostasis.	Charts, whiteboard, marker, internet projector.	- Measure respiratory rate by observing flank movement. - Measure heart rate using stethoscope auscultation. - Record both the respiratory and heart rates from at least three animals, comparing with species reference	Guide students to; - Measure respiratory rate by observing flank movement. - Measure heart rate using stethoscope auscultation. - Record both the respiratory and heart rates from at least three	Stethoscopes, EDTA tubes, microhaematocritt tubes, microhaematocritt reader, centrifuge, PPE

				ranges. • Determine PCV using microhaematocrit tubes and a centrifuge,	animals, comparing with species reference ranges. • Determine PCV using microhaematocrit tubes and a centrifuge	
General Objective 4.0: Understand Physiology of the Urinary System						
9	4.1 Describe nephron function. 4.2 Explain urine concentration 4.3 Explain water balance.	• Explain nephron function. • Explain urine concentration • Explain water balance.	Charts, whiteboard, marker, internet projector.	• Conduct urinalysis on urine samples. • Interpret accorded findings.	Guide students to; • Conduct urinalysis on urine samples • Record and interpret findings.	Urine samples, urinometer, dipsticks, pH paper, slides, PPE.
General Objective 5.0: Understand the physiology of reproduction						
10-11	5.1 Describe the oestrous cycle 5.2 Describe spermatogenesis. 5.3 Explain pregnancy and parturition. 5.4 Describe lactation.	• Explain oestrous cycle • Explain spermatogenesis. • Explain pregnancy and parturition. • Explain lactation.	Charts, whiteboard, marker, internet projector.	• Detect the signs of oestrus in different animals • Demonstrate milk let-down in a lactating animal. • Carry out hand and machine, milking	Guide students to; • Detect the signs of oestrus in different animals • Demonstrate milk let-down in a lactating animal. • Conduct hand and machine, milking	Dairy animals, heat-detection charts, milking equipment, PPE.
GENERAL OBJECTIVE 6.0: Understand the physiology of endocrine, nervous and sensory systems						
12-15	6.1 Explain endocrine glands and their hormones. 6.2 Describe basic nervous-	• Outline endocrine glands and their hormones.	Charts, whiteboard, reference	• Demonstrate the patellar reflex and pupillary light reflex	Guide students to; • Demonstrate the patellar reflex and	Reflex hammer, penlight, calm

	system function. 6.3 Describe special senses.	• Explain basic nervous-system functions. • Explain special senses.	materials, projector.	on a calm animal, • Demonstrate positive and negative responses.	pupillary light reflex on a calm animal, • Demonstrate positive and negative responses.	animals, PPE.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						



FARM ANIMAL DISEASES

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: FARM ANIMAL DISEASES	COURSE CODE: ANH 315	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of the major diseases of farm animals in Nigeria, their clinical signs, diagnosis, prevention and control.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: Understand the concept of disease; 2.0 Understand bacterial diseases of farm animals; 3.0 Understand viral diseases of farm animals; 4.0 Understand parasitic and protozoal diseases; 5.0 Understand nutritional and metabolic diseases; 6.0 Know disease-prevention and biosecurity measures.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: FARM ANIMAL DISEASES			COURSE CODE: ANH 315		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of the major diseases of farm animals in Nigeria, their clinical signs, diagnosis, prevention and control.						
GENERAL OBJECTIVE 1.0: Understand the concept of disease						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Define disease and its types. 1.2 Explain causes (etiology). 1.3 Outline epidemiological terms.	• Explain disease and its types. • Discuss causes (etiology). • Outline epidemiological terms.	Charts, projector, lecture notes.	• Compute morbidity and mortality rates from outbreak data.	Guide students to: • Provide a sample outbreak data set (cases, deaths, population at risk) • compute morbidity, mortality and case-fatality rates, • interpret what the figures mean for outbreak severity.	Outbreak data, worksheets, calculator.
General Objective 2.0: Understand bacterial diseases						
3-5	2.1 Describe anthrax, blackleg, tetanus. 2.2 Describe haemorrhagic septicaemia, brucellosis. 2.3 Describe contagious bovine pleuropneumonia (CBPP), tuberculosis.	• Explainanthrax, blackleg, tetanus. • Discuss haemorrhagic septicaemia, brucellosis.	Charts, photographs, projector.	• Guide students to: • Conduct the California Mastitis test. • Test cows on the dairy unit • Record results per	Guide students to: • Conduct the California Mastitis test. • Test cows on the dairy unit	CMT paddle, reagent, milk samples, post-mortem

	2.4 Describe mastitis.	• Discuss contagious bovine pleuropneumonia (CBPP), tuberculosis. • Explain mastitis.		quarter.	• Record results per quarter.	specimens, charts, PPE.
General Objective 3.0: Understand viral diseases						
6-7	3.1 Describe foot-and-mouth disease, PPR, lumpy skin. 3.2 Describe Newcastle disease, avian influenza, Gumboro. 3.3 Describe African swine fever, rabies.	• Discuss foot-and-mouth disease, PPR, lumpy skin. • Discuss Newcastle disease, avian influenza, Gumboro. • Discuss African swine fever, rabies.	Projector, white marker board, lecture notes.	Guide students to: • Carry out vaccination in chickens — LaSota by drinking water, intraocular and intranasal — • Vaccinate at least 10 birds on the institutional farm using each of these routes correctly. • Demonstrate proper handling, and inspect the cold-chain log.	Guide students to: • Demonstrate ND vaccination in chickens — LaSota by drinking water, intraocular and intranasal — • vaccinate at least 10 birds on the institutional farm using each of these routes correctly. • Demonstrate proper handling, and inspect the cold-chain log.	Birds, ND vaccine, droppers, syringes, rabies vaccine, cold-chain log.
General Objective 4.0: Understand parasitic and protozoal diseases						
8-9	4.1 Describe trypanosomiasis, babesiosis. 4.2 Describe major helminthoses. 4.3 Describe coccidiosis.	• Explain trypanosomiasis, babesiosis. • Explain major helminthoses. • Explain coccidiosis.	Projector, white marker board, lecture notes.	Guide students to: • Prepare slides of trypanosomes and protozoal life-stages • Identify each under microscope using oil immersion.	Guide students to: • Prepare slides of trypanosomes and protozoal life-stages • Identify each under microscope	Microscope, parasite slides, faecal samples, McMaster slide,

				• Carry out faecal flotation technique (saturated salt solution, McMaster slide), • Perform the test on a faecal sample, count eggs per gram, • Identify by morphology.	using oil immersion. • Carry out the faecal flotation technique (saturated salt solution, McMaster slide), • Perform the test on a faecal sample, count eggs per gram, • Identify by morphology.	saturated NaCl.
General Objective 5.0: Understand Nutritional and Metabolic Diseases						
10-12	5.1 Define nutritional deficiencies 5.2 Outline major nutritional deficiencies. 5.3 Describe major metabolic diseases.	• Explain nutritional deficiencies • Discuss major nutritional deficiencies. • Discuss major metabolic diseases.	Charts, projector, case photographs, lecture notes	• Identify clinical signs of metabolic diseases; • Administer calcium therapy.	Guide students to; • Identify clinical signs of metabolic diseases; • Administer calcium therapy	Calcium-borogluconate, case cows, charts. PPE
General Objective 6.0: Know disease-prevention and biosecurity measures						
13-15	6.1 Describe biosecurity principles. 6.2 Describe vaccination programmes. 6.3 Describe disease reporting.	• Discuss biosecurity principles. • Discuss vaccination programmes. • Explain disease reporting.	Projector, white marker board, lecture notes.	• Audit a farm's biosecurity using a checklist.	Guide students to: • Audit a farm's biosecurity using a checklist.	Farm site, biosecurity audit checklist, camera, PPE.

COURSE ASSESSMENT:

Course work: 10%

Test/Assignments: 10%

Practical 40%

Examination: 40%

Total: 100%



GENERAL LIVESTOCK PRODUCTION

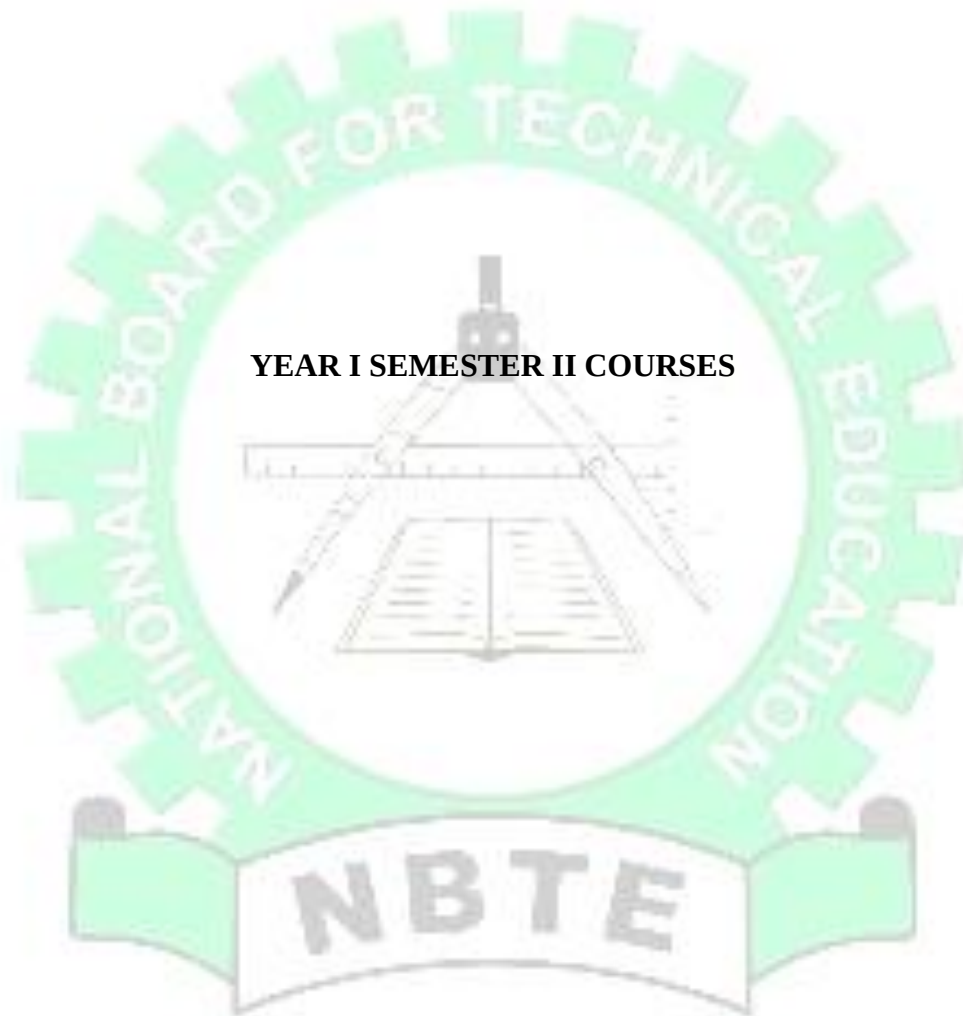
PROGRAMME: HIGHER NATIONAL DIPLOMA (HND) IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: GENERAL LIVESTOCK PRODUCTION	COURSE CODE: ANH 316	CONTACT HOURS: 4 HOURS//WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 3 HOURS//WEEK
GOAL: This course is designed to equip students with knowledge and skills on modern livestock production across the major species.		
GENERAL OBJECTIVES: On completion of this course, the students should be able to: 1.0 Understand poultry production; 2.0 Understand swine production, finishing and digital marketing; 3.0 Understand rabbit and small ruminant production with neonatal small ruminants (SR) care; 4.0 Understand modern dairy production and machine milking; 5.0 Understand feedlot operations with weight and body condition score (BCS) monitoring; 6.0 Understand climate-smart livestock production.		

PROGRAMME: HIGHER NATIONAL DIPLOMA (HND) IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: GENERAL LIVESTOCK PRODUCTION			COURSE CODE: ANH 316	CONTACT HOURS: 4 HOURS/WEEK		
				THEORETICAL: 1 HOUR/WEEK		
YEAR: II SEMESTER: I			CREDIT UNIT: 4	PRACTICAL: 3 HOUR/WEEK		
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills on modern livestock production across the major species						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
GENERAL OBJECTIVE 1.0: Understand poultry production						
1-2	1.1 Describe poultry breeds and incubation. 1.2 Describe layer and broiler management 1.3 Describe turkey, duck and guinea fowl management.	• Explain poultry breeds and incubation. • Explain layer and broiler management • Explain turkey, duck, and guinea fowl management	Charts, reference textbook, whiteboard marker, projector.	• Identify different breeds of poultry • Set up the brooder • Provide water and feed to the day-old chicks (DOCs). • Monitor temperature, FCR and mortality during brooding. • Record in a daily log.	Guide students to: • Identify different breeds of poultry • Set up the brooder unit • Receive, water and feed the DOCs. • Monitor temperature, FCR and mortality during brooding, recording in a daily log.	Broilers, layers, noilers, guinea fowls, duck and turkeys, broiler DOCs, brooder house, feed, candler, hatching eggs, logbook.

GENERAL OBJECTIVE 2.0: Describe swine production, finishing and digital marketing.						
3-5	2.1 Describe breeding, gilts and sows. 2.2 Describe growing-finishing pigs with body condition score (BCS). 2.3 Describe digital and social-media marketing for live pigs and pork.	• Explain breeding, gilts and sows. • Explain growing-finishing pigs with BCS. • Discuss digital and social-media marketing for live pigs and pork.	BCS chart, reference textbook, projector.	• Perform BCS scoring at the shoulder, back and rump of pigs of different stages. • Recommend feeding adjustments where BCS deviates from target. • Set up a swine-marketing page on a chosen platform and produce, publish contents, and review engagement	Guide students to: • Perform BCS scoring at the shoulder, back and rump of pigs of different stages. • Recommend feeding adjustments where BCS deviates from target. • Set up a swine-marketing page on a chosen platform and produce, publish contents, and review engagement	Pigs, BCS chart, smartphones, ring lights, social-media accounts.
GENERAL OBJECTIVE 3.0: Describe rabbit and small-ruminant production with neonatal SR care						
6-7	3.1 Describe rabbits breeds, breeding and management. 3.2 Describe sheep and goat breeds, breeding and management 3.3 Describe neonatal lamb	• Explain rabbits breeds, breeding and management. • Explain sheep and goat breeds, breeding and management • Explain neonatal lamb and kid care.	Charts, reference textbook, computers, projector.	• Assist in parturition, • Perform navel dipping. • Ensure colostrum intake. • Measure colostrum quality	Guide students to: • Assist in parturition, • Perform navel dipping, • Ensure colostrum intake • Measure colostrum quality using Brix refractometer	Pregnant ewes/does, 7% tincture of iodine, stomach tube, Brix refractometer, milk replacer, weighing scale, herd log, egg, castor or olive oil.

	and kid care.			using Brix refractometer • Prepare artificial colostrum • Weigh the neonate, • Record in the herd log, • Monitor for 48 hours.	• Prepare artificial colostrum • Weigh the neonate, • Record in the herd log, • Monitor for 48 hours.	
GENERAL OBJECTIVE 4.0: Describe modern dairy production and machine milking						
8-10	4.1 Describe dairy breeds and milking parlour design. 4.2 Describe machine milking with parlour hygiene. 4.3 Describe somatic- cell-count monitoring.	• Explain dairy breeds and milking parlour design. • Explain machine milking with parlour hygiene. • Discuss somatic-cell-count monitoring.	Charts, Reference textbook, projector.	• Perform the full machine-milking routine on a dairy cow. • Observe hygienic milking protocol. • Perform California Mastitis Test (CMT) on each quarter before milking • Record results. • Interpret results.	Guide students to: • Perform the full machine-milking routine on a dairy cow. • Observe hygienic milking protocol. • Perform CMT on each quarter before milking • Record and interpret results.	Dairy cows, milking machine, CMT paddle, reagent, recording sheets, PPE.
GENERAL OBJECTIVE 5.0: Describe feedlot operations with weight and BCS monitoring						
11-12	5.1 Explain feedlot entry selection and pen design.	• Describe feedlot entry selection and pen design.	BCS chart, calculator, reference	• Weigh feedlot cattle weekly and BCS scoring	Guide students to: • Weigh feedlot cattle weekly and BCS scoring	Cattle, scales, BCS chart, feed-intake log,

	5.2 Describe weekly weight monitoring and BCS. 5.3 Compute break-even finishing.	• Discuss weekly weight monitoring and BCS. • Explain break-even finishing.	textbook, projector.	• Record daily feed intake, • Compute weekly average daily gain (ADG). • Prepare a break-even analysis for the finishing trial.	• Record daily feed intake, • Compute weekly average daily gain (ADG). • Prepare a break-even analysis for the finishing trial.	calculator.
GENERAL OBJECTIVE 6.0: Describe climate-smart livestock production						
13-15	6.1 Describe heat-stress mitigation. 6.2 Describe water-use efficiency and low-methane emission diets. 6.3 Describe climate-resilient breeds.	• Explain heat-stress mitigation. • Explain water-use efficiency and low-methane emission diets. • Discuss climate-resilient breeds.	Charts, reference textbooks, whiteboard marker, projector.	• Design a one-page climate-smart improvement plan with costed measures and an implementation schedule.	Guide students to: • Design a one-page climate-smart improvement plan with costed measures and an implementation schedule.	Farm site, NIMET data, planning template, calculator.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						



YEAR I SEMESTER II COURSES

HISTOLOGY AND EMBRYOLOGY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: HISTOLOGY AND EMBRYOLOGY	COURSE CODE: ANH 321	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to enable students with the knowledge and skills on microscopic structure of animal tissues and the embryonic development of organs and systems.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand the terms histology and embryology; 2.0 Understand fertilisation, cell division and germ layers; 3.0 Understand morphogenesis and histogenesis; 4.0 Understand epithelial, connective, muscle and nervous tissues; 5.0 Understand the histology of major organ systems.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: HISTOLOGY AND EMBRYOLOGY			COURSE CODE: ANH 321		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: II			PRE-REQUISITE: ANH 311		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to enable students understand the microscopic structure of animal tissues and the embryonic development of organs and systems.						
GENERAL OBJECTIVE 1.0: Understand histology and embryology terms						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-3	1.1Define histology and embryology. 1.2Explain tissue preparation methods. 1.3Outline staining techniques.	• Explain histology and embryology. • Describe tissue preparation methods. • Outline staining techniques.	Projector, white marker board, lecture notes.	• Operate a compound microscope using oil immersion. • Identify cell components on HandE slides.	Guide students to: • Operate a compound microscope using oil immersion. • Identify cell components on HandE slides	Microscopes, immersion oil, prepared HandE slides, PPE.
General Objective 2.0: Understand fertilisation, cell division and germ layers						
4-6	2.1 Explain fertilisation. 2.2 Explain mitosis and meiosis. 2.3 Describe the three germ layers and their derivatives.	• Describe fertilisation. • Explain mitosis and meiosis. • Discuss the three germ layers and their derivatives.	Projector, white marker board, lecture notes.	• Prepare slides of onion root-tip and whitefish blastula • Identify prophase, metaphase, anaphase and telophase, • Sketch each stage.	Guide students to: • Prepare slides of onion root-tip and whitefish blastula • Identify prophase, metaphase, anaphase and telophase, • Sketch each stage.	Microscopes, root-tip and blastula slides, PPE.

General Objective 3.0: Understand morphogenesis and histogenesis

7-9	3.1 Describe vertebrate morphogenesis. 3.2 Describe histogenesis. 3.3 Outline placenta types.	• Describe vertebrate morphogenesis. • Describe histogenesis. • Outline placenta types.	Projector, white marker board, lecture notes.	• Collect fresh placentae from cows, ewes and bitches, • Identify the cotyledons, chorioallantois, amnion and umbilical cord on each, • Record structural differences between species.	Guide students to: • Collect fresh placentae from cows, ewes and (where available) bitches, • Identify the cotyledons, chorioallantois, amnion and umbilical cord on each, • Record structural differences between species.	Fresh placentae, gloves, scalpels, charts, PPE.
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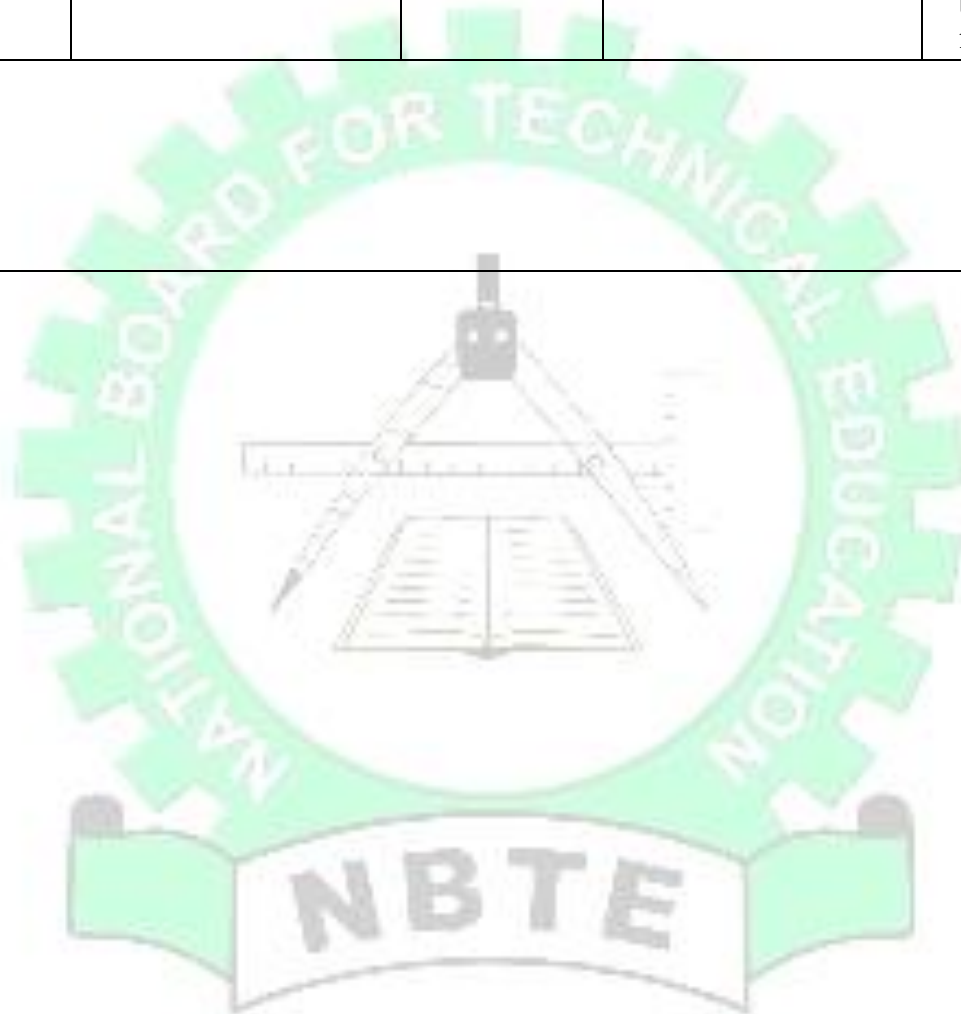
General Objective 4.0: Understand the four basic tissues

10-12	4.1 Explain the types of epithelium. 4.2 Describe connective-tissue types. 4.3 Describe muscle tissues. 4.4 Describe nervous tissue.	• Discuss the types of epithelium. • Discuss connective-tissue types. • Discuss muscle tissues. • Discuss nervous tissue.	Projector, white marker board, lecture notes.	• Identify the four basic tissues under microscope.	Guide students to: • Identify the four basic tissues under microscope	Microscopes, tissue slide sets, sketching worksheets, PPE.
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General Objective 5.0: Understand histology of organ systems

13-15	5.1 Explain alimentary tract and liver. 5.2 Explain kidney and genital organs. 5.3 Describe respiratory tract. 5.4 Describe blood vessels.	• Discuss alimentary tract and liver. • Discuss kidney and genital organs. • Explain respiratory tract. • Explain blood	Microscopes, slides, charts.	• Prepare set of slides covering all the major organ systems • Identify the diagnostic features of each. • Sketch well labelled	Guide students to: • Prepare set of slides covering all the major organ systems • Identify the diagnostic features	Microscopes, organ-system teaching slides, PPE.
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		vessels.		diagnostic features of each.	of each, • Sketch and label the diagnostic features of each.	
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						



GENERAL PATHOLOGY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: GENERAL PATHOLOGY	COURSE CODE: ANH 322	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills on the general processes of disease in animals		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand disease aetiology and immunology; 2.0 Understand cell and tissue injury; 3.0 Understand vascular disturbances and circulatory pathology; 4.0 Understand inflammation and wound healing; 5.0 Understand neoplasia and tissue degeneration.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: GENERAL PATHOLOGY		COURSE CODE: ANH 322			CONTACT HOURS: 4 HOURS/WEEK	
		CREDIT UNIT: 4			THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: II		PRE-REQUISITE:			PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills on the general processes of disease in animals						
GENERAL OBJECTIVE 1.0: Understand disease aetiology and immunology						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-3	1.1 Explain the history of pathology. 1.2 Explain the basic terms used in pathology 1.3 Describe routes of infection and basic immunology.	• Outline the history of pathology. • Discuss all the basic terms used in pathology. • Discuss routes of infection and basic immunology.	Charts, photographs, projector, pathology textbook, whiteboard.	• Identify different lesion types from organ specimen and photographs.	Guide students to; • Identify different lesion types from organ specimen and photographs.	Case photographs, preserved tissues/organ, atlas of pathology.
General Objective 2.0: Understand cell and tissue injury						
4-6	2.1 Describe reversible cell injury. 2.2 Describe necrosis and gangrene. 2.3 Describe atrophy, hypertrophy, hyperplasia, metaplasia.	• Explain reversible cell injury. • Explain necrosis and gangrene. • Explain atrophy, hypertrophy, hyperplasia, metaplasia.	Charts, photographs, projector, textbook.	• Identify necrosis types on gross specimen • Carry out the microscopic pattern, • Tabulate the differences between the necrosis types on a comparison sheet.	Guide students to; • Identify necrosis types on gross specimen • Identify the microscopic pattern, • Tabulate the differences between the necrosis types on	Gross specimens, microscope slides, comparison worksheets.

					a comparison sheet.	
General Objective 3.0: Understand vascular disturbances						
7-9	3.1 Explain oedema, congestion and haemorrhage. 3.2 Explain thrombosis, embolism and infarction. 3.3 Explain shock	- Describe oedema, congestion and haemorrhage. - Describe thrombosis, embolism and infarction. - Describe shock.	Charts, photographs, projector, textbook.	- Conduct post-mortems where available - Identify gross signs of congestion, haemorrhage, thrombosis and infarction - Document findings in a PM report form.	Guide students to: - Conduct post-mortems where available - Identify gross signs of congestion, haemorrhage, thrombosis and infarction - Document findings in a PM report form.	PM specimens, charts, PM report form templates, PPE.
General Objective 4.0: Understand inflammation and wound healing						
10-12	4.1 Explain the inflammatory response. 4.2 Describe the classification of inflammation by exudate and duration. 4.3 Explain wound healing.	- Describe the inflammatory response. - Discuss the classification of inflammation by exudate and duration. - Explain wound healing.	Charts, slides, projector, wound photographs.	- Identify the inflammation types from prepared slides and gross specimens. - Write one paragraph histopathology description of one slide.	Guide students to: - Identify the inflammation types from prepared slides and gross specimens. - Write one paragraph histopathology description of one slide.	Microscope slides, gross specimens, microscopes, writing pads.
General Objective 5.0: Understand neoplasia and tissue degeneration						

13-15	5.1 Define neoplasia and tumour nomenclature. 5.2 Differentiate benign and malignant tumours. 5.3 Describe major neoplasms of veterinary importance.	• Explain neoplasia and tumour nomenclature. • Distinguish benign and malignant tumours. • Discuss major neoplasms of veterinary importance.	Projector, white marker board, lecture notes.	• Identify common tumours on gross specimens and slides; • Perform fine-needle aspirate.	Guide students to: • Identify common tumours from gross specimens and histology slides. • Perform an FNA	Specimens, slides, FNA needles, syringes, Diff-Quik stain, microscope.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

FARM ANIMAL PARASITOLOGY I

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: FARM ANIMAL PARASITOLOGY	COURSE CODE: ANH 323	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT:4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of the major parasites of farm animals in nigeria.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand parasitism and classification of parasites; 2.0 Understand helminths of veterinary importance; 3.0 Understand arthropod parasites; 4.0 Understand protozoal parasites; 5.0 Apply parasitological diagnosis and control.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: FARM ANIMAL PARASITOLOGY I			COURSE CODE: ANH 323		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: II			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of the major parasites of farm animals in Nigeria						
GENERAL OBJECTIVE 1.0: Understand parasitism and classification						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Define parasitism and types of parasites. 1.2 Explain the classification of parasites of veterinary importance. 1.3 Highlight economic losses due to parasites.	• Explain parasitism and types of parasites. • Describe the classification parasites of veterinary importance. • Outline economic losses due to parasites.	Charts, projector, parasitology textbook, whiteboard	• Identify different types of parasites from prepared slides and preserved specimen. • Classify each parasite into its taxonomic group.	Guide students to; • Identify different types of parasites from prepared slides and preserved specimen. • Classify each parasite into its taxonomic group.	Microscopes, slide sets.
General Objective 2.0: Understand helminths of veterinary importance						
3-6	2.1 Explain major trematodes. 2.2 Explain major cestodes. 2.3 Describe major nematodes	• Describe major trematodes • Describe major cestodes. • Discuss major nematodes.	Charts, projector, parasitology textbook, Whiteboard	• Identify gross morphology, size and key diagnostic features of trematodes, cestodes and nematodes from preserved specimen • Carry out the	Guide students to: • Identify gross morphology, size and key diagnostic features of trematodes, cestodes and	Adult helminth specimens, microscopes, McMaster slides, saturated NaCl, balance. PPE

				McMaster egg-count technique step by step.	nematodes from preserved specimen	
					Conduct the McMaster egg-count technique step by step.	
General Objective 3.0: Understand arthropod parasites						
7-9	3.1 Explain major ticks of Veterinary importance in Nigeria. 3.2 Explain mites, lice and fleas. 3.3 Describe biting flies.	- Describe major ticks of veterinary importance in Nigeria. - Discuss mites, lice and fleas. - Discuss biting flies.	Charts, projector, parasitology textbook, whiteboard.	- Identify the various types arthropods parasites from preserved specimen. - Identify each parasite up to genus level using a dichotomous key.	Guide students to: - Identify the various types arthropods parasites from preserved specimen. - Identify each parasite up to genus level using a dichotomous key.	Preserved specimens, slides, magnifying lens, microscopes, dichotomous keys, PPE
General Objective 4.0: Understand protozoal parasites						
10-11	4.1 Explain Trypanosoma, Babesia, Theileria. 4.2 Explain Eimeria. 4.3 Explain Toxoplasma and Cryptosporidium	- Describe Trypanosoma, Babesia, Theileria. - Describe Eimeria. - Describe Toxoplasma and Cryptosporidium.	Charts, projector, parasitology textbook, whiteboard.	Guide students to: - Identify different blood parasites using stained blood smears - Measure parasitaemia from each prepared slides. - Conduct faecal smears for possible	Guide students to: - Identify different blood parasites using stained blood smears - Measure parasitaemia from each prepared slides. - Conduct faecal smears for	Stained smears, ZN stain, microscopes, oil, PPE

				detection of coccidial oocysts and Cryptosporidium • Perform modified Ziehl-Neelsen staining • Identify the organisms.	possible detection of coccidial oocysts and Cryptosporidium • Perform modified Ziehl-Neelsen staining • Identify the organisms.	
General Objective 5.0: Know parasitological diagnosis and control						
12-15	5.1 Describe parasitological diagnostic methods. 5.2 Describe strategic anthelmintic use and anthelmintic resistance. 5.3 Describe integrated parasite management.	• Describe parasitological diagnostic methods. • Describe strategic anthelmintic use and anthelmintic resistance. • Describe integrated parasite management	Charts, projector, parasitology textbook.	• Collect faecal samples from a group of sheep before and 14 days after post treatment. • Conduct egg counts pre- and post-treatment, • Compute % reduction, and interpret resistance status against the 95% threshold.	Guide students to: • Collect faecal samples from a group of sheep before and 14 days after post treatment. • Conduct egg counts pre- and post-treatment, • compute % reduction, and interpret resistance status against the 95% threshold.	Sheep, anthelmintic, faecal sample bags, McMaster slides, saturated NaCl.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

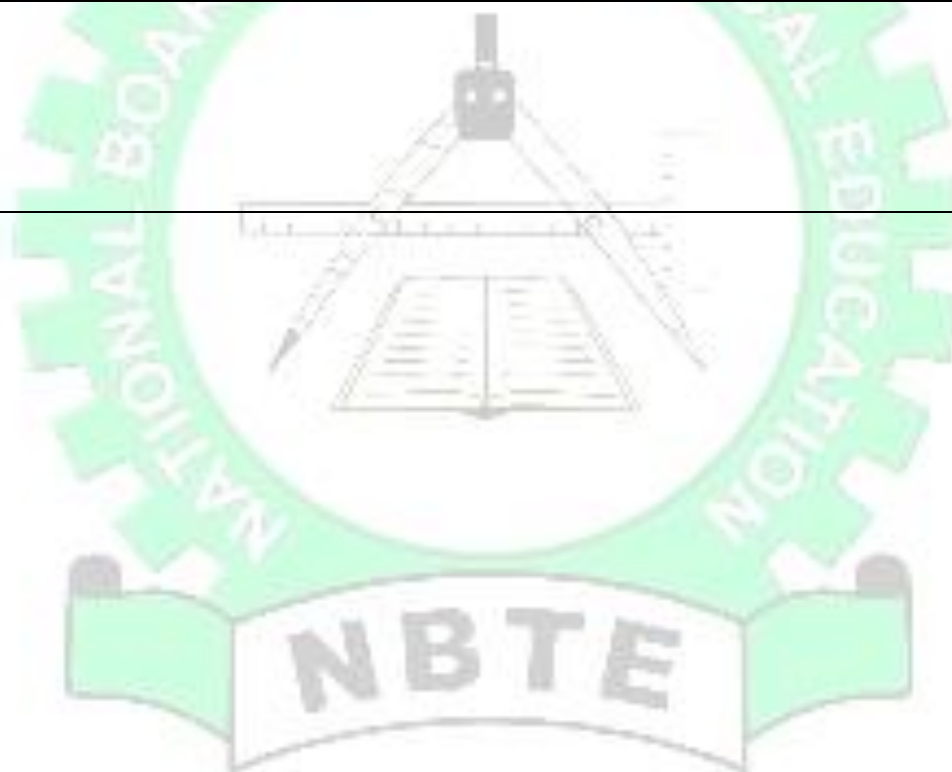
AGRICULTURAL BIOCHEMISTRY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: AGRICULTURAL BIOCHEMISTRY	COURSE CODE: ANH 324	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip learners with the knowledge and skills of biochemical knowledge of feed ingredients and animal nutrition.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand the chemistry of feed nutrients; 2.0 Understand proximate analysis and feed evaluation; 3.0 Understand vitamins and minerals; 4.0 Understand anti-nutritional factors.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: AGRICULTURAL BIOCHEMISTRY		COURSE CODE: ANH 324		CONTACT HOURS: 3 HOURS/WEEK		
		CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK		
YEAR: I SEMESTER: II		PRE-REQUISITE:		PRACTICAL: 2 HOURS/WEEK		
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip learners with the knowledge and skills of biochemical knowledge of feed ingredients and animal nutrition.						
GENERAL OBJECTIVE 1.0: Understand the chemistry of feed nutrients						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-4	1.1 Explain carbohydrates of feeds. 1.2 Explain proteins and amino acids of feeds. 1.3 Describe lipids of feeds.	- Describe carbohydrates of feeds. - Describe proteins and amino acids of feeds. - Discuss lipids of feeds.	Projector, white marker board, lecture notes.	- Lay out a comprehensive feed-ingredient bench - Identify each ingredient by sight, touch, smell and basic chemistry, - Record observations.	Guide students to: - Lay out a comprehensive feed-ingredient bench - Identify each ingredient by sight, touch, smell and basic chemistry, - Record observations.	Feed ingredient samples, magnifying lens, sample trays.
General Objective 2.0: Understand proximate analysis						
5-8	2.1 Explain the Weende proximate system. 2.2 Outline proximate-analysis steps. 2.3 Explain the interpretation of results.	- Describe the Weende proximate system. - Outline proximate-analysis steps. - Describe the	Projector, white marker board, lecture notes.	- Determine moisture, ash, crude protein, crude fat and crude fibre of a feed sample. - Produce proximate analysis report.	Determine moisture, ash, crude protein, crude fat and crude fibre of a feed sample.	Hot-air oven, muffle furnace, Kjeldahl apparatus, Soxhlet apparatus,

		interpretation of results.			• Produce a one-page analysis report	balance, crucibles, reagents, feed samples.
General Objective 3.0: Understand vitamins and minerals						
9-11	3.1 Explain vitamins and its classification. 3.2 Describe minerals and its classification. 3.3 Describe deficiency syndromes.	• Describe vitamins and its classification • Explain minerals and its classification. • Discuss deficiency syndromes.	Projector, white marker board, lecture notes.	• Identify vitamin-mineral premix samples for poultry, pigs and ruminants, • Demonstrate reading the label for vitamin and mineral content, • Compute the correct inclusion level (typically 0.25–1% of diet) for a given ration.	Guide students to: • Identify vitamin-mineral premix samples for poultry, pigs and ruminants, • Demonstrate reading the label for vitamin and mineral content, • Compute the correct inclusion level (typically 0.25–1% of diet) for a given ration.	Premix samples, ration sheets, calculator.
General Objective 4.0: Understand anti-nutritional factors						
12-15	4.1 Define anti-nutritional factors. 4.2 List ANFs in major feedstuffs. 4.3 Explain processing to reduce ANFs.	• Describe anti-nutritional factors. • Enumerate ANFs in major feedstuffs. • Describe processing to reduce ANFs.	Projector, white marker board, lecture notes.	Guide students to: • Conduct the cyanide test on cassava chips using picrate paper, observing colour change against a standard. • Test fresh and processed cassava and	Guide students to: • Conduct the cyanide test on cassava chips using picrate paper, observing colour change against a standard. • Test fresh and processed cassava and • Tabulate the	Cassava samples, picrate paper, maize samples, aflatoxin test strips.

				• Tabulate the differences. • Carry out a qualitative aflatoxin spot test or rapid test strip on a maize • Test stored maize and discuss the implications.	difference. • Carry out a qualitative aflatoxin spot test or rapid test strip on a maize • Test stored maize and discuss the implications.	
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						



APPLIED ANIMAL NUTRITION AND FEED SAFETY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: APPLIED ANIMAL NUTRITION AND FEED SAFETY	COURSE CODE: ANH 325	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills in feedmill operation, feed formulation, and feed safety.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand principles of animal nutrition; 2.0 Know computer-aided least-cost feed formulation; 3.0 Understand feedmill operation and quality control; 4.0 Know value-addition to crop residues and by-products; 5.0 Know feed-quality testing.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: APPLIED ANIMAL NUTRITION AND FEED SAFETY				COURSE CODE: ANH 325		CONTACT HOURS:4 HOURS/WEEK
				CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: II				PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills in feedmill operation, feed formulation and feed safety.						
GENERAL OBJECTIVE 1.0: Understand principles of animal nutrition						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-3	1.1 Explain nutrient requirements by species. 1.2 Outline digestion in monogastric animal 1.3 Explain digestion ruminant animals 1.4 Describe water quality and requirements.	- Describe nutrient requirements by species. - digestion in monogastric animal - Explain digestion ruminant animals. - Discuss water quality requirements.	Projector, white marker board, lecture notes	- Look up nutrient requirements from the NRC/FAO/NIAS tables - Compute daily intake for different classes and production stages of livestock. - Identify water delivery system - Carry out water quality management techniques	Guide students to; - Look up nutrient requirements from the NRC/FAO/NIAS tables - Compute daily intake for different classes and production stages of livestock. - Identify water delivery system - Carry out water quality management techniques.	NRC/FAO/NIAS/SON/NAFDAC tables, worksheets, sample animals, calculator.
General Objective 2.0: Know computer-aided feed formulation and feed cost optimization						

4-6	2.1 Define computer-aided formulation. 2.2 Explain spreadsheet-based and approved digital feed-formulation tools. 2.3 Explain quality-control in rations formulation. 2.4 Describe market price fluctuations using digital market data sources.	- Describe computer-aided formulation. - Describe spreadsheet-based and approved digital feed-formulation tools. - Describe quality-control in rations formulation. - Discuss market price fluctuations using digital market data sources.	Projector, white marker board, lecture notes	- Formulate a least-cost broiler-finisher ration using spreadsheet-based and approved digital feed-formulation tools to achieve desired results according to NRC/FAO/NIAS/SON/NAFDAC standards using current Nigerian ingredient prices. - formulate the same ration manually - Compare cost-per-tonne with the Solver output/or spreadsheet-based and approved digital feed-formulation tools.	Guide students to: - Formulate a least-cost broiler-finisher ration using spreadsheet-based and approved digital feed-formulation tools to achieve desired results according to NRC/FAO/NIAS/SON/NAFDAC standards using current Nigerian ingredient prices. - formulate the same ration manually - Compare cost-per-tonne with the Solver output/or related digital apps.	Computers, spreadsheet-based and approved digital feed-formulation tools, ingredient price data, NRC/FAO/NIAS/SON/NAFDAC tables.
General Objective 3.0: Understand feedmill operation and quality control						
7-9	3.1 Describe feedmill layout and unit operations. 3.2 Describe pellet quality and quality-control parameters. 3.3 Describe mycotoxin screening	- Explain feedmill layout and unit operations. - Explain pellet quality and quality-control parameters.	Whiteboard, marker, charts, projector.	- Carry out feedmill operations procedure in a commercial or institutional feedmill, - Record observations and audit the QA log.	Guide students to: Carry out feedmill operations procedure in a commercial or institutional feedmill,	Feedmill site, PDI tester, sieves, salt marker, balance, charts.

	3.4 Explain personnel safety in feedmill.	• Discuss mycotoxin screening • Discuss personnel safety in feedmill.		• Conduct the PDI test using a tumbling-can apparatus and the mixer-uniformity test. • Compute results against acceptable thresholds. • Sample and screen mycotoxins	• Record observations and audit the QA log. • Conduct the PDI test using a tumbling-can apparatus and the mixer-uniformity test. • Compute results against acceptable thresholds. • Sample and screen mycotoxins	
General Objective 4.0: Know value-addition to crop residues and by-products						
10-12	4.1 State major Nigerian agro-industrial by-products. 4.2 Explain urea treatment of crop straws. 4.3 Outline the sources and uses of molasses. 4.4 Outline silage making from crop residues.	• Outline major Nigerian agro-industrial by-products. • Describe urea treatment of crop straws. • Explain the sources and uses of molasses. • Explain silage making from crop residues.	Whiteboard, marker, charts, projector.	• Produce molasses-urea blocks. • Make silage from crop residues.	Guide students to: • Produce molasses-urea blocks. • Make silage from crop residues.	Maize stover, urea, molasses, lime, mineral premix, drums, scale, pH meter, calculator. Crop residues, urea, molasses, drums, charts, PPE.
General Objective 5.0: Know feed-quality assurance						
13-15	5.1 Describe routine feed-quality tests. 5.2 Outline corrective	• Explain routine feed-quality tests • Outline corrective	Whiteboard, marker, charts, projector.	• Perform routine QA testing on a delivered feed batch.	Guide students to: • Apply the routine QA	Feed sample, moisture meter,

	measures for feed quality anomalies. 5.3 Outline feed and ingredient traceability (sourcing logs, records and batching	measures for feed quality anomalies. • Explain feed and ingredient traceability (sourcing logs, records and batching			tests on feed and ingredients • Compare results with the standard specification, document deviations and corrective measures. • Write a brief acceptance/rejection recommendation.	Kjeldahl, mycotoxin strips, charts, PPE.
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COURSE ASSESSMENT:

Course work: 10%

Test/Assignments: 10%

Practical 40%

Examination: 40%

Total: 100%

LIVESTOCK EXTENSION AND DIGITAL ADVISORY SERVICES

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: LIVESTOCK EXTENSION AND DIGITAL ADVISORY SERVICES	COURSE CODE: ANH 326	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: I SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with the knowledge and skills required to deliver livestock extension and advisory services.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand livestock extension principles and communication methods; 2.0 Understand digital livestock advisory and farmer-support services; 3.0 Understand field data collection, reporting and farmer documentation; 4.0 Understand participatory extension approaches in livestock communities; 5.0 Know livestock training, awareness and advisory materials; 6.0 Understand digital tools for livestock communication and extension delivery; 7.0 Know biosecurity, welfare and climate-smart advisory principles in field extension systems.		

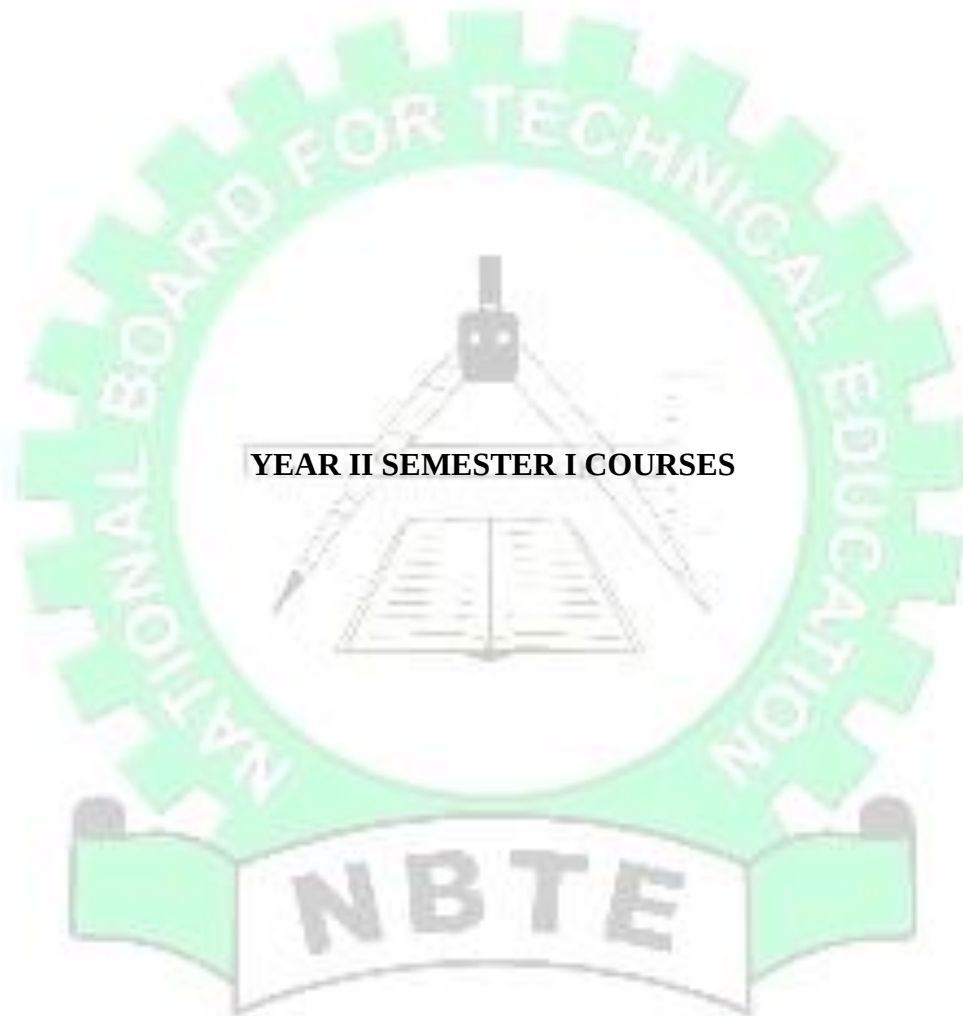
PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: LIVESTOCK EXTENSION AND DIGITAL ADVISORY SERVICES			COURSE CODE: ANH 326		CONTACT HOURS: 3 HOURS/WEEK	
			CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: II			PRE-REQUISITE:		PRACTICAL: 2 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with the knowledge and skills required to deliver livestock extension and advisory services						
GENERAL OBJECTIVE 1.0: Understand livestock extension principles and communication methods.						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Explain livestock extension principles and advisory systems. 1.2 Describe the roles of livestock extension personnel. 1.3 Explain communication channels used in livestock extension.	• Discuss livestock extension systems in Nigeria. • Discuss public and private livestock advisory models. • Discuss communication methods used in livestock extension.	Projector, extension manuals, livestock posters, whiteboard.	• Identify extension activities carried out. • Interview extension personnel and document their responsibilities.	Guide students to; • Identify extension activities carried out. • Interview extension personnel and document their responsibilities.	Field notebooks, smartphones where available, interview guide, transport.
General Objective 2.0: Understand digital livestock advisory and farmer-support services.						
3-4	2.1 Explain digital livestock advisory systems. 2.2 Describe digital tools used in livestock extension. 2.3 Explain the use of mobile communication in livestock advisory services.	• Explain digital livestock advisory systems. • Discuss digital tools used in livestock extension. • Explain the use	Projector, extension manuals, livestock posters, whiteboard.	• Create digital advisory content. • Collect data digitally. • Analyse collected data	Guide students to: • Create digital advisory content. • Collect data digitally. • Analyse collected data	Smartphones, laptops, KoboToolbox/Google Forms, mobile data.

		of mobile communication in livestock advisory services.				
General Objective 3.0: Understand field data collection, reporting and farmer documentation.						
5-6	3.1 Explain livestock data collection methods. 3.2 Explain farm record systems used in livestock extension. 3.3 Explain reporting procedures in livestock field operations.	- Describe livestock data collection methods. - Describe farm record systems used in livestock extension. - Describe reporting procedures in livestock field operations.	Sample livestock records, farm logs, projector.	- Collect livestock production records from a farm. - Prepare a simple extension field report.	Guide students to: - Collect livestock production records from a farm. - Prepare a simple extension field report.	Farm record sheets, smartphones, field notebooks, sample logbooks.
General Objective 4.0: Understand participatory extension approaches in livestock communities.						
7-8	4.1 Explain participatory livestock extension approaches. 4.2 Describe community engagement methods. 4.3 Explain gender and youth inclusion in livestock extension systems.	- Explain participatory livestock extension approaches. - Explain community engagement methods. - Explain gender and youth inclusion in livestock extension systems.	Extension manuals, flip charts, projector.	- Conduct a mock livestock farmer group meeting - Identify animal health challenges.	Guide students to: - Conduct a mock livestock farmer group meeting - Identify animal health challenges.	Flip charts, markers, role-play materials.
General Objective 5.0: Know livestock training, awareness and advisory materials.						

9-10	5.1 Explain livestock training materials. 5.2 Explain livestock awareness campaign strategies. 5.3 Describe methods for translating technical information into farmer-friendly language.	• Discuss livestock training materials. • Explain livestock awareness campaign strategies. • Explain methods for translating technical information into farmer-friendly language.	Projector, livestock pamphlets, extension materials, whiteboard	• Design livestock awareness posters, handbills, fliers. • Prepare short extension presentations on disease prevention, feeding or biosecurity.	Guide students to: • Design livestock awareness posters, handbills, fliers • Prepare short extension presentations on disease prevention, feeding or biosecurity.	Laptops, design templates, printers where available, markers.
General Objective 6.0 Understand digital tools for livestock communication and extension delivery.						
11-12	6.1 Explain digital communication ethics and misinformation risks. 6.2 Describe digital farmer engagement methods. 6.3 Explain the use of social media for livestock enterprise communication.	• Explain digital communication ethics and misinformation risks. • Explain digital farmer engagement methods. • Explain the use of social media for livestock enterprise communication.	Projector, livestock pamphlets, extension materials, whiteboard.	• Develop a simple digital livestock advisory campaign using WhatsApp Business, Facebook pages or short-form video platforms.	Guide students to: • Develop a simple digital livestock advisory campaign using WhatsApp Business, Facebook pages or short-form video platforms.	Laptops, internet access where available.
General Objective 7.0 Know biosecurity, welfare and climate-smart advisory principles in field extension systems						
13-15	7.1 Explain biosecurity advisory systems. 7.2 Describe climate-smart livestock advisory practices. 7.3 Explain welfare-focused livestock extension approaches.	• Explain biosecurity advisory systems. • Discuss climate-smart livestock advisory practices. • Explain welfare-focused livestock extension approaches.	Biosecurity charts, extension manuals, projector.	• Carry out farm biosecurity assessment • Prepare advisory recommendations • Develop climate-smart livestock advisory checklists	Guide students to: • Conduct farm biosecurity assessment • Prepare advisory recommendations • Develop climate-smart livestock	PPE, checklists, thermometers, field notebooks, smartphones where available.

				for smallholder farms.	advisory checklists for smallholder farms.	
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						





YEAR II SEMESTER I COURSES

POULTRY DISEASES, BIOSECURITY AND HATCHERY OPERATIONS

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: POULTRY DISEASES, BIOSECURITY AND HATCHERY OPERATIONS	COURSE CODE: ANH 411	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills in poultry-disease prevention and control, with modern hatchery biosecurity and commercial egg-management competencies.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand poultry-disease principles and biosecurity; 2.0 Understand bacterial, viral and fungal poultry diseases; 3.0 Understand parasitic, nutritional and metabolic poultry diseases; 4.0 Understand post-mortem procedure in poultry; 5.0 Understand Features of poultry hatchery; 6.0 Understand egg management in the hatchery; 7.0 Understand incubation techniques and procedure; 8.0 Understand hatching and proceeding of day-old chicks; 9.0 Understand hatchery equipment maintenance; 10.0 Understand biosecurity protocols in the hatchery; 11.0 Understand monitoring and audits (Quality Control measures); 12.0 Understand crises management in the Hatchery.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: POULTRY DISEASES, BIOSECURITY AND HATCHERY OPERATIONS			COURSE CODE: ANH 411		CONTACT HOURS: 3 HOURS/WEEK	
			CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 2 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills in poultry-disease prevention and control, with modern hatchery biosecurity and commercial egg-management competencies.						
GENERAL OBJECTIVE 1.0: Understand poultry disease principles and biosecurity.						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1	1.1 State the principles of disease prevention and control in poultry 1.2 Define poultry biosecurity 1.3 Explain principles of biosecurity 1.4 Explain sources of poultry farm contamination 1.5 Describe how to develop a biosecurity plan for a poultry farm 1.6 Explain how to perform biosecurity audit on poultry farm 1.7 Describe some recommended biosecurity practices on poultry farm	• Outline the principles of disease prevention and control in poultry • Describe poultry biosecurity • Describe principles of biosecurity • Explain sources of poultry farm contamination • Explain how to develop a biosecurity plan for a poultry farm • Explain how to perform biosecurity audit on a farm	Charts, projector, biosecurity photos, white board, marker, Internet	• Develop a biosecurity plan for a poultry farm • Perform biosecurity audit on a farm	Guide students to: • Develop a biosecurity plan for a poultry farm • Perform biosecurity audit on a farm	Biosecurity checklist, farm site, camera. PPE, Work book,

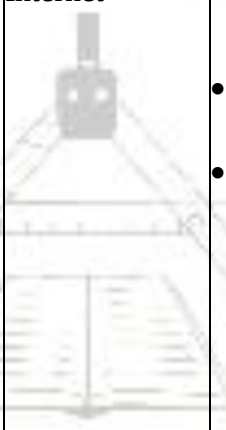
		Explain some biosecurity practices on poultry farm				
General Objective 2.0: Understand bacterial, viral and fungal poultry diseases						
2	2.1 Explain the major bacterial poultry diseases. 2.2 Explain the major viral poultry diseases 2.3 Explain the major fungal poultry diseases.	- Describe the major bacterial, poultry diseases. - Discuss the major viral poultry diseases - Describe the major fungal poultry diseases.	Charts, projector, white board marker, Internet	- Identify some bacterial diseases based on clinical signs and gross lesions - Identify some viral diseases based on clinical signs and gross lesions - Identify some fungal diseases based on clinical signs and gross lesions	Guide students to: - Identify some bacterial diseases based on clinical signs and gross lesions - Identify some viral diseases based on clinical signs and gross lesions - Identify some fungal diseases based on clinical signs and gross lesions	Veterinary clinic, veterinary hospital, PPE, Atlas of Poultry Diseases, Work book,
General Objective 3.0: Understand parasitic, nutritional and metabolic poultry diseases						
3	3.1 Explain internal parasitic diseases of poultry. 3.2 Explain external parasitic diseases of poultry 3.3 Explain nutritional and metabolic diseases of poultry	- Describe the major endo-parasitic poultry diseases. - Describe the major ecto-parasitic poultry diseases - Describe the major	Charts, projector, white board, marker, Internet	- Identify protozoal parasites - Identify helminth parasites - Identify ecto-parasites - Identify nutritional disorders	Guide students to: - Identify protozoal parasites - Identify helminth parasites - Identify ecto-parasites	Microscopes, faecal samples, parasite specimens, McMaster slides, dewormers, birds,

		nutritional and metabolic poultry diseases.		Identify metabolic disorders	- Identify nutritional disorders - Identify metabolic disorders	Necropsy kits, Camera, PPE,
General Objective 4.0: Understand post-mortem procedure in poultry.						
4	4.1 List the indications for post-mortem examination of dead birds 4.2 List the post-mortem instruments and their uses 4.3 Describe precautions for post-mortem examination 4.4 Describe how to euthanize birds for post-mortem examination 4.5 Describe the techniques/procedure for post-mortem examination of birds 4.6 Explain interpretation of post-mortem lesions 4.7 Describe post-mortem sample collection procedure	- Explain the indications for post-mortem examination of dead birds - Enumerate the post-mortem instruments and their uses - Explain precautions for post-mortem examination - Explain how to euthanize birds for post-mortem examination - Explain the techniques/procedure for post-mortem examination of birds - Explain interpretation of post-mortem lesions - Explain post-mortem sample collection procedure	Charts, projector, white board, marker, Internet, Atlas of poultry diseases	- Identify post-mortem instruments - Apply the precautions for post-mortem examination - Euthanize birds for post-mortem examination - Perform post-mortem examination on birds - Identify and interpret post-mortem lesions - Collect diagnostic samples during post-mortem	Guide students to: - Identify post-mortem instruments - Apply the precautions for post-mortem examination - euthanize birds for post-mortem examination - Carry out post-mortem examination on birds - Identify and interpret post-mortem lesions - Collect diagnostic samples during post-mortem	bird specimens, Necropsy kits, Camera, PPE, Atlas of Avian gross pathology, Work book,

General Objective 5.0: Understand Features of poultry hatchery						
5	5.1 Define Poultry hatchery 5.2 List factors to consider in setting up a poultry hatchery 5.3 Explain types of hatchery designs and floor plan 5.4 List the features of a poultry hatchery 5.5 Explain hatchery accessories	• Discuss a poultry hatchery • Explain factors to consider in setting up a poultry hatchery • Describe types of hatchery designs and floor plans • Discuss the features of a poultry hatcher and their functions (egg receiving/fumigation room, egg storage room, setter room, hatcher room) • Discuss hatchery accessories (incubators, setters, hatchers)	Charts, Projector, white board, marker, Internet	• Draw a hatchery design and floor plan • Identify the features of a hatchery on the above drawing • Identify hatchery accessories	Guide students to: • Draw a hatchery design and floor plan • Identify the features of a hatchery on the above drawing • Identify hatchery accessories	Hatchery visit, PPE, Charts,
GENERAL OBJECTIVE 6.0: Understand egg management in the hatchery.						
6	6.1 Describe how to receive eggs 6.2 Describe how to sanitize and fumigate eggs 6.3 Describe how to store	• Explain how to receive eggs transported from breeder farm • Explain egg	Charts, Projector, white board, marker, Internet	• Carry out egg candling procedure • Perform grading and selection of eggs for setter set up	Guide students to; • Carry out egg candling procedure • Grade and select	Hatchery visit, candling, dark room, candling light, PPE, Marker,

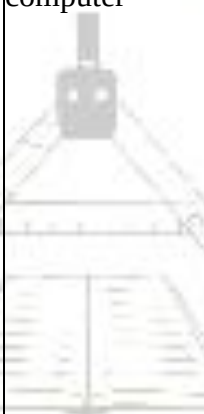
	eggs and conditions for storage 6.4 Describe egg candling procedure 6.5 Describe criteria for selection and grading of eggs for setter set up.	sanitation and fumigation procedures • Explain egg storage and storage conditions (temperature, humidity) • Explain egg candling procedure • Explain criteria selection and grading of eggs for setter set up.		• Identify good eggs for incubation	eggs for setter set up • Identify good eggs for incubation	
GENERAL OBJECTIVE 7.0: Understand incubation techniques and procedure.						
7	7.1 Describe pre-warming (conditioning) of eggs for incubation 7.2 Describe the required temperature, humidity and ventilation for egg incubation 7.3 Describe egg turning procedure during incubation	• Explain pre-warming (conditioning) of eggs for incubation • Explain the required temperature, humidity and ventilation for egg incubation • Explain egg turning procedure during incubation	Charts, Projector, white board, marker, Internet	• Identify parts of a poultry incubator and their uses • Prepare eggs for incubation • Turn eggs during incubation • Calibrate egg incubation conditions	Guide students to: • Identify parts of a poultry incubator and their uses • Prepare eggs for incubation • Turn eggs during incubation • Calibrate egg incubation conditions	Poultry hatchery visit, egg incubator, PPE, Record book
GENERAL OBJECTIVE 8.0: Understand hatching and proceeding of day-old chicks						
8	8.1 Explain the procedure for	• Describe the procedure for transfer,	Charts, Projector,	• Position eggs in a setter/hatcher	Guide students to: • Position eggs in a	Poultry hatchery visit,

	transfer, placement and positioning of eggs in a setter machine 8.2 Explain the hatcher conditions (temperature, humidity, ventilation) 8.3 Explain post hatching procedures (handling and removal of hatched chicks, grading and processing) 8.4 Describe how to calculate percentage hatchability of eggs 8.5 Describe techniques for vaccination of day-old chicks against Mareks disease, HPAI, etc 8.6 List causes of	placement and positioning of eggs in a setter machine • Describe the hatcher conditions (temperature, humidity, ventilation) • Describe post hatching procedures (handling and removal of hatched chicks, grading and processing) • Describe percentage hatchability of eggs • Describe techniques for vaccination of day-old chicks against Mareks disease, HPAI, etc • Explain causes of eggs failing to hatch	white board, marker, Internet	• Calibrate egg hatching conditions • Grade and process day-old chicks • Calculate percentage hatchability of eggs • Vaccinate day-old chicks against Mareks disease, HPAI	setter/hatcher • Calibrate egg hatching conditions • Grade and process day-old chicks • Calculate percentage hatchability of eggs • Vaccinate day-old chicks against Mareks disease, HPAI	egg setter/hatcher, PPE, Record book, calculator, chick boxes, vaccinator (syringes and needles)
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	eggs failing to hatch					
GENERAL OBJECTIVE 9.0: Understand hatchery equipment maintenance						
9-10	9.1 List common causes of breakdown of poultry hatchery equipment 9.2 Explain how to develop a routine hatchery equipment maintenance plan 9.3 Explain how to calibrate temperature, humidity, CO2 sensors after repairs 9.4 Explain how to clean and disinfect incubators and setters/hatchers 9.5 Explain how to check the viability of mechanical equipment	- Describe common causes of breakdown of poultry hatchery equipment - Describe how to develop a routine hatchery equipment maintenance plan - Describe how to calibrate temperature, humidity, CO2 sensors after repairs - Describe how to clean and disinfect incubators and setters/hatchers - Describe how to check the viability of mechanical equipment	Charts, Projector, white board, marker, Internet 	- Identify common faults in a hatchery equipment - Develop a hatchery equipment maintenance plan - Calibrate temperature, humidity, CO2 sensors - Demonstrate how to clean and disinfect incubator, setters/hatchers	- Identify common faults in a hatchery equipment - Develop a hatchery equipment maintenance plan - Calibrate temperature, humidity, CO2 sensors - Demonstrate how to clean and disinfect incubator, setters/hatchers	Poultry hatchery visit, incubator, egg setter/hatcher, PPE, Machine manual, record book
GENERAL OBJECTIVE 10.0: Understand biosecurity protocols in the hatchery						
11-12	10.1 List common hatchery contaminants 10.2 Explain the sources of	Explain common hatchery contaminants	Charts, Projector, white board,	Identify common hatchery disinfectants and how to use them	Guide students to: Identify common hatchery	Poultry hatchery visit, PPE, Record

	poultry hatchery contamination 10.3 List hatchery disinfectants and how to use them 10.4 Explain biosecurity practices for different hatchery sections 10.5 Explain the methods of hatchery waste disposal (dead chicks, dead-in-shell embryos, hatching debris, waste water)	- Describe the sources of poultry hatchery contamination - Describe hatchery disinfectants and how to use them - Describe some biosecurity practices for different hatchery sections - Explain the methods of hatchery waste disposal (dead chicks, dead-in-shell embryos, hatching debris, waste water)	marker, Internet	- Conduct some biosecurity practices for different hatchery sections - Identify hatchery waste - Dispose hatchery waste	disinfectants and how to use them - Conduct some biosecurity practices for different hatchery sections - Identify hatchery waste - Dispose hatchery waste	book, waste bin bags,
GENERAL OBJECTIVE 11.0: Understand monitoring and audits (Quality Control measures)						
13-14	11.1 List the indications for monitoring and auditing in a hatchery 11.2 Describe monitoring by visual inspection of some equipment and operations in the hatchery - Incubation parameters - Air quality	- Explain the indications for monitoring and auditing in a hatchery - Explain monitoring by visual inspection of some equipment and operations in the hatchery: - Incubation parameters - Air quality - Water quality	Charts, Projector, white board, marker, Internet	- Carry out visual inspection of hatchery facility - Collect samples for microbiological testing - Perform chick quality control - Develop a checklist for hatchery auditing - Audit the structural	- Carry out visual inspection of hatchery facility - Collect samples for microbiological testing - Perform chick quality control - Develop a checklist for	

	- Water quality 11.3 Describe how to carry out routine sampling for microbiological testing 11.4 Describe how to perform chick quality control 11.5 Describe how to monitor hatchery sanitation and biosecurity (cleaning validation, pest control, staff hygienic practices) 11.6 Explain types of hatchery audit (Internal audit, second-party audit, third-party audit) 1.1 Describe an audit checklist for hatchery (records, physical requirements, biosecurity, operational process)	• Explain how to carry out routine sampling for microbiological testing • Explain how to perform chick quality control • Explain how to monitor hatchery sanitation and biosecurity (cleaning validation, pest control, staff hygienic practices) • Explain types of hatchery audit (Internal audit, second-party audit, third-party audit) • Explain an audit checklist for hatchery (records, physical requirements, biosecurity, operational process)		and operational biosecurity of the hatchery	hatchery auditing • Audit the structural and operational biosecurity of the hatchery Demonstrate how to audit the structural and operational biosecurity of the hatchery	
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GENERAL OBJECTIVE 12.0: Understand crises management in the Hatchery						
15	12.1 List some common crises in the poultry hatchery (diseases outbreaks, natural disasters, utility failure, cyber-attacks) 12.2 List the causes of crises in a poultry hatchery 12.3 Describe how to manage crises in poultry hatchery 12.4 Explain how to develop a crisis management plan for a hatchery	• Explain some common crises in the poultry hatchery (diseases outbreaks, natural disasters, utility failure, cyber-attacks) • Explain the causes of crises in a poultry hatchery • Explain how to manage crises in poultry hatchery • Explain how to develop a crisis management plan for a hatchery	Charts, Projector, white board, marker, Internet, computer 			
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

CLINICAL TECHNIQUES I

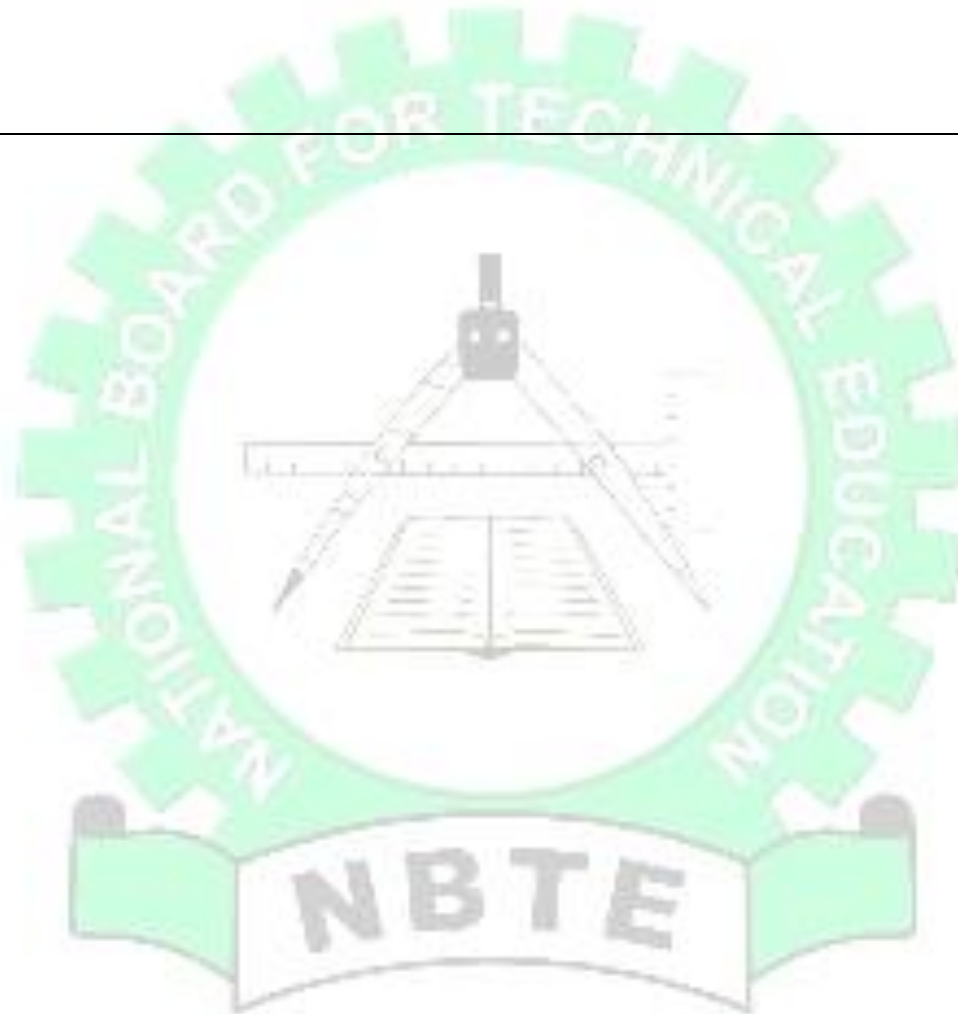
PROGRAMME: HIGHER NATIONAL DIPLOMA (HND) IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: CLINICAL TECHNIQUES I	COURSE CODE: ANH 412	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 3 HOUR/WEEK
GOAL: This course is designed to equip students with knowledge and skills in clinical techniques		
GENERAL OBJECTIVES: On completion of this course, the students should be able to: 1.0 Understand animal identification, handling and welfare; 2.0 Know dosages and drugs preparation; 3.0 Understand basic veterinary diagnostic techniques; 4.0 Understand instrument Sterilisation and preparation of animals for surgery; 5.0 Know wounds and common surgical conditions.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: CLINICAL TECHNIQUES I			COURSE CODE: ANH 412		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills in clinical techniques.						
GENERAL OBJECTIVE 1.0: Understand animal identification, handling and welfare						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-3	1.1 Explain animal-identification methods. 1.2 Explain WOAHA welfare codes and the five-domains model. 1.3 Explain low-stress handling and modern restraint. 1.4 Explain biosecurity zoning.	- Describe animal-identification methods. - Describe WOAHA welfare codes and the five-domains model. - Describe low-stress handling and modern restraint. - Describe biosecurity zoning.	Whiteboard, reference materials, charts, projector.	- Restrain different animals. - Score the welfare of a chosen animal on the institutional farm, - Identify the lowest-scoring domain and recommend improvements.	Guide students to: - Restrain different animals. - Score the welfare of a chosen animal on the institutional farm, - Identify the lowest-scoring domain and recommend improvements.	Cattle, sheep, pigs, halters, head-bail, snare, panels, welfare scoresheet.
GENERAL OBJECTIVE 2.0: Know dosages and drugs preparation						
4-6	2.1 Explain drug dosages by body weight. 2.2 Explain powdered drugs reconstitution. 2.3 Explain correct drugs concentrations.	- Describe drug dosages by body weight. - Describe powdered drugs reconstitution. - Discuss correct drugs	Whiteboard, reference materials, charts, projector.	- Set clinical scenarios - Calculate the correct dose and constitutes, - Administer the dose by the appropriate route	Guide students to; - set of clinical scenarios - calculate the correct dose and constitutes - Administer the	Drug samples, syringes, demonstration animals, charts.

		concentrations.			dose by the appropriate route.	
GENERAL OBJECTIVE 3.0: Understand basic veterinary diagnostic techniques						
7-9	3.1 Describe minimum equipment list. 3.2 Describe Lay out for safety and workflow. 3.3 Outline quality control.	• Discuss minimum equipment list. • Discuss Lay out for safety and workflow. • Outline quality control.	Whiteboard, reference materials, charts, projector.	• Identify the equipment in clinical diagnostic-lab.	• Identify the equipment in clinical diagnostic-lab .	Lab space, equipment, SOPs, signage, PPE.
GENERAL OBJECTIVE 4.0: Understand instrument Sterilisation and preparation of animals for surgery						
10-12	4.1 Describe sterilisation methods. 4.2 Describe aseptic technique. 4.3 Describe an animal and surgical site.	• Explain sterilisation methods. • Explain aseptic technique. • Discuss an animal and surgical site.	Whiteboard, reference materials, charts, projector.	• Demonstrate the autoclaving cycle • Carry out full aseptic site preparation on a model or live animal for a minor procedure	• Demonstrate the autoclaving cycle • Perform full aseptic site preparation on a model or live animal for a minor procedure	Autoclave, surgical instruments, drapes, animals, antiseptics, PPE.
GENERAL OBJECTIVE 5.0: Know wounds and common surgical conditions						
13-15	5.1 Describe wounds and burns classification. 5.2 Describe wound management. 5.3 Describe castration, dehorning and hoof trimming.	• Explain wounds and burns classification. • Discuss wound management. • Explain castration, dehorning and hoof trimming.	Whiteboard, reference materials, charts, projector.	• Carry out wound dressing. • Carry out castration, dehorning and hoof trimming.	Guide students to; • Conduct wound dressing. • Conduct castration, dehorning and hoof trimming.	Calves, lambs/kids, instruments (Burdizzo, elastrator, dehorner, hoof shears), antiseptics, PPE.

COURSE ASSESSMENT:

Course work:	10%
Test/Assignments:	10%
Practical	40%
Examination:	40%
Total:	100%



FARM ANIMAL PARASITOLOGY II

PROGRAMME: HIGHER NATIONAL DIPLOMA (HND) IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: FARM ANIMAL PARASITOLOGY II	COURSE CODE: ANH 413	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: I	PRE-REQUISITE: APT 411	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills in farm animal parasites with emphasis on diagnosis, life cycles and control in Nigerian livestock and companion animals.		
GENERAL OBJECTIVES: On completion of this course, the students should be able to: 1.0 Understand protozoa and parasitic conditions; 2.0 Understand mastigophora; 3.0 Understand sarcodina; 4.0 Understand sporozoa; 5.0 Understand insects of veterinary importance.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: FARM ANIMAL PARASITOLOGY II			COURSE CODE: ANH 413		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills in farm animal parasites with emphasis on diagnosis, life cycles and control in Nigerian livestock and companion animals						
GENERAL OBJECTIVE 1.0: Understand protozoa and parasitic conditions						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-3	1.1 Explain the classification of protozoa. 1.2 Explain protozoan life cycles. 1.3 Outline control of ectoparasites.	- Describe the classification of protozoa. - Describe protozoan life cycles. - Discribe control of ectoparasites.	Charts, prepared slides, projector.	Identify protozoa on Giemsa-stained blood smears.	Guide students to; Identify protozoa on Giemsa-stained blood smears.	Microscopes, slides, Giemsa stain, blood samples, oil.
GENERAL OBJECTIVE 2.0: Understand mastigophora						
4-6	2.1 Describe Trypanosoma. 2.2 Describe Trichomonas, Giardia, Histomonas. 2.3 Outline trypanocide use and resistance.	- Discuss Trypanosoma. - Discuss Trichomonas, Giardia, Histomonas. - Outline trypanocide use and resistance.	Charts, slides, trypanocide samples, projector.	- Identify Trypanosoma on stained blood smears; - Estimate parasitaemia cells.	Guide students to; - Identify Trypanosoma on stained blood smears; - Estimate parasitaemia cells	Stained smears, microscopes, oil, counting grid.
GENERAL OBJECTIVE 3.0: Understand Sarcodina						

7-9	3.1 Explain the classification of Sarcodines 3.2 Describe Entamoeba in animals. 3.3 Describe diagnostic methods.	• Explain the classification of Sarcodines • Discuss Entamoeba in animals. • Discuss diagnostic methods.	Projector, white marker board, lecture notes.	• Prepare a wet-mount • Examine faecal wet-mount for Entamoeba.	Guide students to; • Prepare a wet-mount • Examine faecal wet-mount for Entamoeba	Faecal samples, slides, iodine, microscopes.
GENERAL OBJECTIVE 4.0: Understand sporozoan						
10-12	4.1 Describe Eimeria. 4.2 Describe Babesia and Theileria. 4.3 Describe Toxoplasma and Cryptosporidium.	• Discuss Eimeria. • Discuss Babesia and Theileria. • Discuss Toxoplasma and Cryptosporidium.	Projector, white marker board, lecture notes.	• Identify Eimeria oocyst. • Perform modified ZN for Cryptosporidium.	Guide students to; • Identify Eimeria oocysts; • Perform modified ZN for Cryptosporidium	Microscopes, faecal samples, McMaster slides, ZN stain.
GENERAL OBJECTIVE 5.0: Understand insects of veterinary importance						
13-15	5.1 Describe biting flies as disease vectors. 5.2 Describe myiasis-producing flies. 5.3 Describe fleas, lice and bedbugs.	• Discuss biting flies as disease vectors. • Discuss myiasis-producing flies. • Discuss fleas, lice and bedbugs.	Insect specimens, charts, projector.	• Identify flies, fleas and lice. • Design a vector-control programme.	• Identify flies, fleas and lice; • Design a vector-control programme (poultry, dairy unit).	Specimens, microscopes, keys, design templates.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

PHARMACOLOGY AND THERAPEUTICS I

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: PHARMACOLOGY AND THERAPEUTICS I	COURSE CODE: ANH 414	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of veterinary drugs and prudent-use of antimicrobial stewardship.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand pharmacology principles; 2.0 Understand drug administration; 3.0 Understand chemotherapy and Anti-Microbial Resistance (AMR) stewardship; 4.0 Understand antibacterial, antifungal and antiviral agents; 5.0 Understand antihelmintics, antiprotozoans and insecticides.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: PHARMACOLOGY AND THERAPEUTICS I			COURSE CODE: CPT 414		CONTACT HOURS: 3 HOURS/WEEK	
			CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 2 HOUR/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of veterinary drugs and prudent-use of antimicrobial stewardship.						
GENERAL OBJECTIVE 1.0: Understand pharmacology principles						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-3	1.1 Define pharmacology terms. 1.2 Explain drug classifications and nomenclature. 1.3 Describe drugs presentation	• Describe pharmacology terms. • Explain drug classifications and nomenclature. • Explain drugs presentation	Charts, samples, projector, marker board	• Identify different classes of drugs • Identify different presentation of drugs	Guide students to; • Identify different classes of drugs • Identify different presentation of drugs	Drugs store, charts, projector
General Objective 2.0: Understand drug administration						
4-6	2.1 Explain drugs administration 2.2 Explain routes of drugs administration 2.3 Explain drug dosages and calculation 2.4 Explain drug absorption. 2.5 Explain drug distribution. 2.6 Explain drug metabolism and excretion.	• Describe drugs administration • Describe routes of drugs administration • Describe drug dosages and calculation • Describe drug absorption.	Charts, samples, projector, marker board	• Identify different routes of administration • Calculate the dosage of different drugs • Administer drugs via different routes	Guide students to; • Identify different routes of administration • Calculate the dosage of different drugs • Administer drugs via different	Syringes, drenchers, bolous guns, troca and cannula, mentholated spirit, cooton wool, PPE

		• Explain drug distribution. • Explain drug metabolism and excretion.			routes	
General Objective 3.0: Understand chemotherapy and AMR stewardship						
7-9	3.1 Define chemotherapy. 3.2 Explain AMR and mechanisms. 3.3 Explain AMR-stewardship principles. 3.4 State NAFDAC and FAO-WOAH guidelines.	• Describe chemotherapy. • Describe AMR and mechanisms. • Explain AMR-stewardship principles. • Explain NAFDAC and FAO-WOAH guidelines.	Charts, AMR surveillance reports, NAFDAC, FOA-WHO list, projector, marker board.			
General Objective 4.0: Understand antibacterial, antifungal and antiviral agents						
10-12	4.1 Explain major antibiotic classes. 4.2 Explain nitrofurans and sulphonamides. 4.3 Explain antifungal and antiviral agents.	• Describe major antibiotic classes. • Describe nitrofurans and sulphonamides. • Describe antifungal and antiviral agents.	Drug samples, charts, projector, marker board.			
General Objective 5.0: Understand antihelmintics, antiprotozoans and insecticides						
13-15	5.1 Explain antihelmintic classes. 5.2 Explain antiprotozoans and coccidiostats. 5.3 Explain insecticides and their safety.	• Describe antihelmintic classes. • Explain antiprotozoans and coccidiostats.	Drug samples, charts, projector.	• Administer antihelmintics to ruminants • Administer antiprotozoans to poultry, goat, sheep and pig	Guide students to; • Administer antihelmintics • Administer antiprotozoans to poultry, goat, sheep and pig	Antihelmintics, Anti protozoa, insecticides

		• Explain insecticides and their safety.		• Spray insectides in animal housing	• Spray insectides in animal housing	
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COURSE ASSESSMENT:

Course work: 10%

Test/Assignments: 10%

Practical 40%

Examination: 40%

Total: 100%



SYSTEMIC PATHOLOGY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: SYSTEMIC PATHOLOGY	COURSE CODE: ANH 415	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: I	PRE-REQUISITE: ANH 322	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of recognising, describing and interpretation of the pathological changes associated with the major body systems of Animals.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Know the pathology of the respiratory system; 2.0 Know the pathology of the digestive system; 3.0 Know important aspects of neuropathology; 4.0 Know diseases of the urogenital system; 5.0 Know the pathology of the circulatory system; 6.0 Know the pathology of the musculoskeletal system; 7.0 Know the pathology of the endocrine system; 8.0 understand the effects of burns in animals; 9.0 Know post-mortem examination and submission of specimens for laboratory analysis.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: SYSTEMIC PATHOLOGY			COURSE CODE: ANH 415		CONTACT HOURS: 3 HOURS/WEEK	
			CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: I			PRE-REQUISITE: ANH 322		PRACTICAL: 2 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of recognising, describing and interpretation of the pathological changes associated with the major body systems of Animals.						
GENERAL OBJECTIVE 1.0: Know the pathology of the respiratory system						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1	1.1 Describe the major patterns of pneumonia. 1.2 Describe the gross and microscopic lesions of major endemic mammalian respiratory diseases. 1.3 Describe the pathologies and lesion distributions of the avian respiratory system	• Explain the major patterns of pneumonia. • Explain the gross and microscopic lesions of major endemic mammalian respiratory diseases. • Explain the pathologies and lesion distributions of the avian respiratory system	Charts, slides, whiteboard, textbooks, projector.	• Identify pneumonic lungs from different animals. • Conduct floating test, to confirm pulmonary consolidation. • Observe croupous/fibrinous exudates in bronchopneumonia slides. • Dissect chickens to evaluate air sac transparency, thickness, and presence of caseous material.	Guide students to; • Identify pneumonic lungs from different animals. • Conduct floating test, to confirm pulmonary consolidation. • Observe croupous/fibrinous exudates in bronchopneumonia slides. • Dissect chickens to evaluate air sac transparency, thickness, and presence of	Pneumonic lung tissues, avian carcasses, dissection boards, PM Kits, fixatives, microscope slides.ppe.

					caseous material.	
General Objective 2.0: Know the pathology of the digestive system						
2	2.1 Describe stomatitis, torsion, gastroenteritis, intussusception, volvulus, etc. 2.2 Describe lesions of some common parasites in the alimentary canal of swine, bovine, canine and equine. 2.3 Describe the pathological lesions seen in rinderpest, foot-and-mouth disease, and acute and chronic fascioliasis.	• Explain stomatitis, torsion, gastroenteritis, intussusception, volvulus, etc. • Explain lesions of some common parasites in the alimentary canal of swine, bovine, canine and equine. • Explain the pathological lesions seen in rinderpest, foot-and-mouth disease, and acute and chronic fascioliasis.	Charts, slides, whiteboard, textbooks, projector.	• Identify gross lesions from the preserved specimens/fresh carcasses covering each pathologies from the system • Identify microscopic lesions from prepared slides, • Submit a one-paragraph histopathology description for the slides.	Guide students to; • Identify gross lesions from the preserved specimens/fresh carcasses covering each pathologies from the system • Identify microscopic lesions from prepared slides, • Submit a one-paragraph histopathology description for the slides.	Gross specimens, prepared slides, microscopes, charts.
General Objective 3.0: Know important aspects of neuropathology						
3	3.1 Explain twitching, convulsion, coma and paralysis 3.2 Explain the pathological lesions seen in infectious diseases, 3.3 Explain the pathological lesions in poisoning in animals 3.4 Explain the pathological	• Explain twitching, convulsion, coma and paralysis • Explain the pathological lesions seen in infectious diseases, • Explain the pathological	Charts, slides, whiteboard, textbooks, projector.	• Identify gross lesions from the preserved specimens/fresh carcasses covering each pathologies from the system • Identify microscopic lesions from prepared slides,.	Guide students to; • Identify gross lesions from the preserved specimens/fresh carcasses covering each pathologies from the system • Identify	Gross specimens, prepared slides, microscopes, charts.

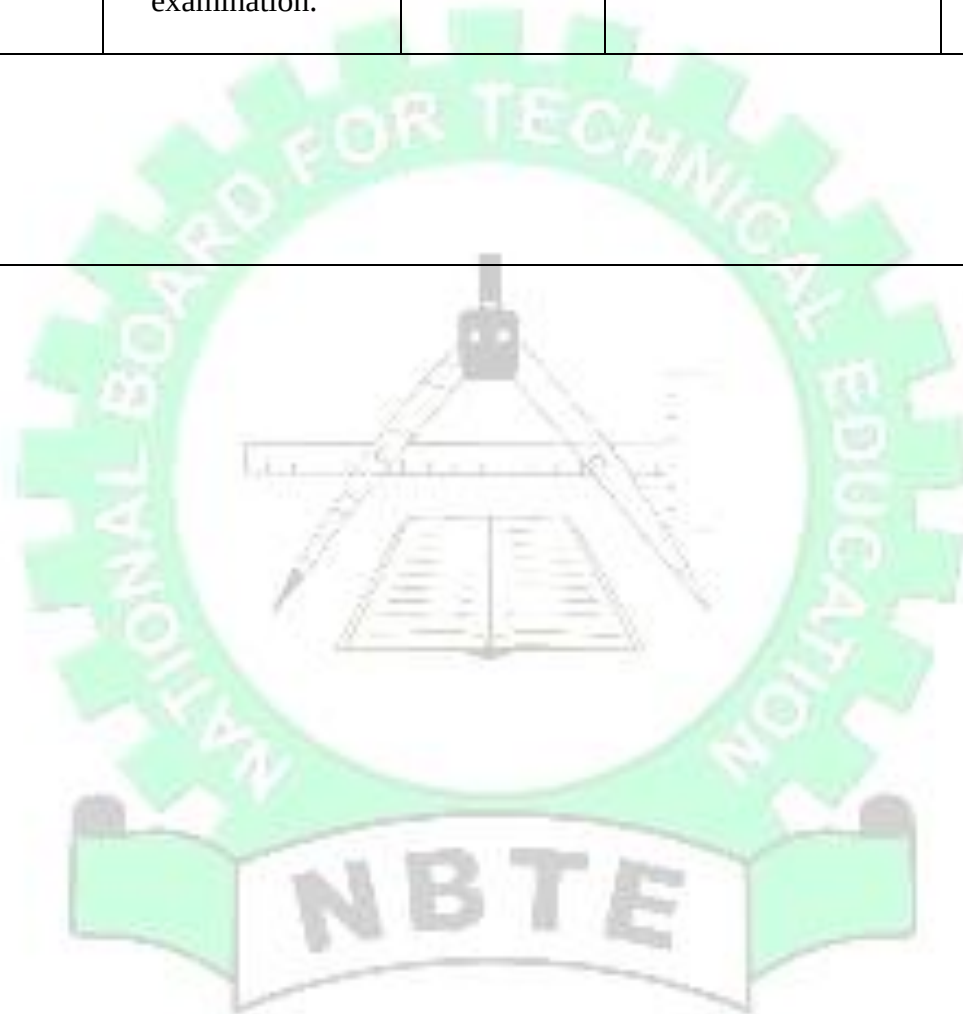
	lesions in metabolic and nutritional in animals	lesions in poisoning in animals • Explain the pathological lesions in metabolic and nutritional in animals			microscopic lesions from prepared slides,.	
General Objective 4.0: Know diseases of the urogenital system						
4-5	4.1 Describe pathological conditions of male urinary systems 4.2 Describe pathological conditions of female urinary systems 4.3 Describe pathological conditions of male genital systems 4.4 Describe pathological conditions of female genital systems .	• Explain pathological conditions of male urinary systems • Explain pathological conditions of female urinary systems • Explain pathological conditions of male genital systems • Explain pathological conditions of female genital systems •	Charts, Lecture notes whiteboard, textbooks, projector.	• Identify pathological conditions of male urinary systems from preserved specimen/ fresh carcass • Identify pathological conditions of female urinary systems from preserved specimen/ fresh carcass • Identify pathological conditions of male genital systems from preserved specimen/ fresh carcass • Identify pathological conditions of female genital systems from preserved specimen/ fresh carcass.	• Identify pathological conditions of male urinary systems from preserved specimen/ fresh carcass • Identify pathological conditions of female urinary systems from preserved specimen/ fresh carcass • Identify pathological conditions of male genital systems from preserved specimen/ fresh carcass	Post-mortem kit, preserved specimens.

					carcass Identify pathological conditions of female genital systems from preserved specimen/ fresh carcass	
General Objective 5.0: Know the pathology of the circulatory system						
6	5.1 Define anaemia. 5.2 Outline the causes of anaemia 5.3 Explain anaemia classification. 5.4 Define heart failure 5.5 Describe the classification of heart failure. 5.6 Explain the signs of heart disease.	- Explain anaemia. - Explain the causes of anaemia - Explain anaemia classification. - Explain heart failure - Explain the classification of heart failure. - Explain the signs of heart disease.	Charts, slides, whiteboard, textbooks, projector.	Identify signs of anaemia and heart failure from post-mortem specimens.	Guide students to; Identify signs of anaemia and heart failure from post-mortem specimens.	Post-mortem kit, heart specimens, charts.
GENERAL OBJECTIVE 6.0: Know the pathology of the musculoskeletal system						
7-8	6.1 Explain congenital defects of muscles. 6.2 Explain congenital defects of bones 6.3 Explain muscle atrophy 6.4. Explain degenerative arthritis.	- Explain congenital defects of muscles. - Explain congenital defects of bones - Explain muscle atrophy.	Charts, whiteboard, textbooks, projector.	- Identify and explain congenital defects such as osteoporosis and osteomalacia. - Identify the causes and effects of lameness in domestic	Guide students to; Identify and explain congenital defects such as osteoporosis and osteomalacia.	Microscope, slide projector, microtome, post-mortem kit, post

	6.5 Explain the causes and effects of lameness in domestic animals.	• Explain degenerative arthritis. • Explain the causes and effects of lameness in domestic animals.		animals. • Identify the defects and causes of lameness from post-mortem specimens	• Identify the causes and effects of lameness in domestic animals • Identify the defects and causes of lameness from post-mortem specimens.	mortem specimens
GENERAL OBJECTIVE 7.0: Know the pathology of the endocrine system						
9-10	7.1 Explain the etiologies and distinct clinical features of pituitary dysfunctions. 7.2 Explain the systemic signs and specific diagnostics for adrenal alterations, 7.3 Explain the metabolic impacts of pancreatic endocrine failure. 7.4 Describe thyroid and parathyroid pathologies,	• Discuss the etiologies and distinct clinical features of pituitary dysfunctions. • Discuss the systemic signs and specific diagnostics for adrenal alterations, • Discuss the metabolic impacts of pancreatic endocrine failure. • Discuss thyroid and parathyroid pathologies,	Charts, whiteboard, textbooks, projector.	• Identify the effects of endocrine malfunction by physical examination • Detect goitre in livestock by physical examination • Identify endocrine effects and detect goitre by physical examination of livestock.	Guide students to; • Identify the effects of endocrine malfunction by physical examination • Detect goitre in livestock by physical examination • Identify endocrine effects and detect goitre by physical examination of livestock.	Livestock, charts.
GENERAL OBJECTIVE 8.0: Know the effects of burns in animals						

11	8.1 Describe burns in animals. 8.2 Outline the causes of burns 8.3 Describe classification of burns. 8.4 Describe the effects of burns on animals.	• Explain burns in animals. • Explain the causes of burns • Explain classification of burns. • Explain the effects of burns on animals.	Charts, Lecture notes, whiteboard, textbooks, projector.	• Identify burns from the animal or from the slides presented	Guide students to • Identify burns from the animal or from the slides presented.	OHP, slide projector, Animal.
GENERAL OBJECTIVE 9.0: Know post-mortem examination and submission of specimens for laboratory analysis						
12	9.1 Explain post-mortem examination. 9.2 Explain the relevance of history-taking for diagnostic purposes. 9.3 Explain the components of a standard post-mortem kit. 9.4 Describe the collection, preservation and submission of pathological samples. 9.5 Explain the uses of a post-mortem kit. 9.6 Outline the procedure for post-mortem examination.	• Explain post-mortem examination. • Explain the relevance of history-taking for diagnostic purposes. • Explain the components of a standard post-mortem kit. • Explain the collection, preservation and submission of pathological samples. • Explain the uses of a post-mortem kit. • Outline the	Charts, slides, whiteboard, textbooks, projector.	• Identify the components of a standard post-mortem kit. • Carry out post-mortem examination • Prepare diagnostic specimens for cold-chain transport to a reference laboratory ensuring compliance with biosafety and shipping regulations	Guide students to; • Identify the components of a standard post-mortem kit. • Carry out post-mortem examination • Prepare diagnostic specimens for cold-chain transport to a reference laboratory ensuring compliance with biosafety and shipping regulations	Cadaver, PM table, dissecting kit, sample bottles, PM report form, PPE.

		procedure for post-mortem examination.				
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						



INTRODUCTION TO APICULTURE AND HIVE PRODUCTS

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: INTRODUCTION TO APICULTURE AND HIVE PRODUCTS	COURSE CODE: ANH 416	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: I	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of Honeybees, hive construction, colony management, bee health, and hive product processing.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand honey-bee biology and colony organization; 2.0 Know how to construct and manage hives; 3.0 Understand seasonal feeding and colony multiplication; 4.0 Know how to Identify and control bee diseases and pests; 5.0 Know how to carry out queen rearing; 6.0 Know harvesting and processing of hive products.		

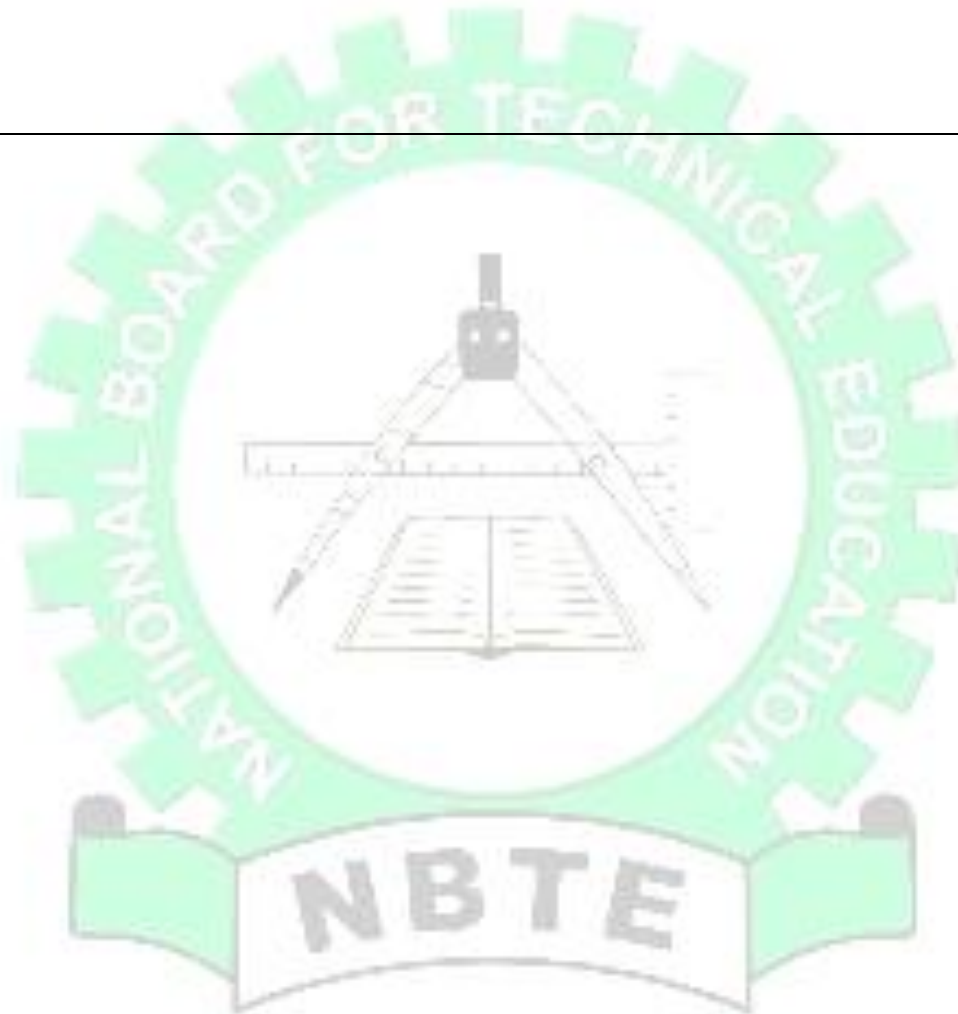
PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: INTRODUCTION TO APICULTURE AND HIVE PRODUCTS				COURSE CODE: ANH 416		CONTACT HOURS: 3 HOURS/WEEK
				CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: I				PRE-REQUISITE:		PRACTICAL: 2 HOURS/WEEK
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of Honeybees, hive construction, colony management, bee health, and hive product processing						
GENERAL OBJECTIVE 1.0: Understand honey-bee biology and colony organization						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Explain the African honeybee and European honeybee species. 1.2 Explain the bee castes stating their roles and lifespans 1.3 Explain the external anatomy of the bee 1.4 Explain key behavioral patterns of bees 1.5 Explain structural colony organization	- Describe the African honeybee and European honeybee species. - Discuss the bee castes stating their roles and lifespans - Describe the external anatomy of the bee - Describe key behavioral patterns of bees - Explain structural colony organization	White board, charts, projector.	- Open a live hive in the institutional apiary - Identify colony components on an opened hive	Guide students to: - Open a live hive in the institutional apiary - Identify bee castes - Identify colony components on an opened hive	Beehive, bee-suits, smoker, hive tool, gloves, frames. Bee specimens
General Objective 2.0: Know how to construct and manage hives.						
3-5	2.1 Explain the common types of	Discuss the common types of hives and	Projector, white marker	Construct bee hives	Guide students to: Construct bee hives	Hive construction materials,

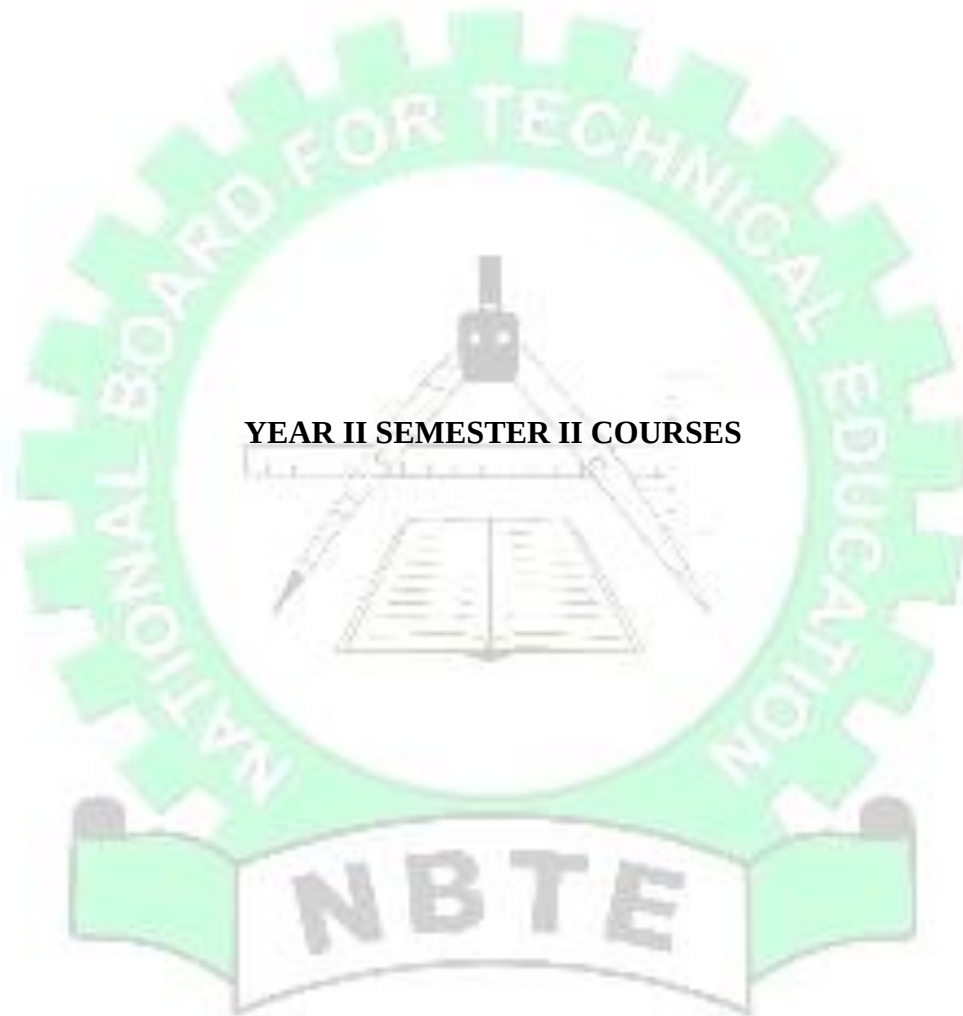
	hives and their characteristics 2.2 Explain precise construction specifications for different types of hives 2.3 Explain apiary siting criteria and how to establish a stocking plan	their characteristics • Explain precise construction specifications for different types of hives • Explain apiary siting criteria and how to establish a stocking plan	board, lecture notes,	• Establish a functional institutional apiary	• Establish a functional institutional apiary	Lumber, nails, hammer, saw, foundation sheets, hive components.
General Objective 3.0: Understand seasonal feeding and colony multiplication						
6-9	3.1 Explain how the production cycle of bees are affected by seasons 3.2 Explain supplemental feeding formulations 3.3 Describe the different colony multiplication methods	• Describe how the production cycle of bees are affected by seasons • Describe supplemental feeding formulations • Describe the different colony multiplication methods	Projector, white marker board, lecture notes	• Prepare supplemental feed • Perform colony multiplication using the different methods by identifying the key components of the hive	Guide students to: • Prepare supplemental feed • Perform colony multiplication using the different methods by identifying the key components of the hive	Populated hives, empty hive bodies, replacement frames, smokers, PPE. Sugar, water
General Objective 4.0: Know how to Identify and control bee diseases and pests						
10-11	4.1 Explain the primary parasites and pests affecting bees 4.2 Explain major	• Describe the primary parasites and pests affecting bees • Describe major	White board, parasite/disease charts, projector	• Identify parasites and pests in hives • Apply integrated pest management • Apply genetic and	Guide students to: • Identify parasites and pests in hives • Apply integrated pest management	Diagnostic kits Hives, jars, icing sugar, sieves, brood frames. PPE

	pathogens and diseases affecting bees 4.3 Describe Integrated Pest Management (IPM) and Control Strategies	pathogens and diseases affecting bees • Describe Integrated Pest Management (IPM) and Control Strategies		preventative biosecurity measures	• Apply genetic and preventative biosecurity measures	
General Objective 5.0: Know how to carry out queen rearing.						
12-13	5.1 Explain queen bee biology and her importance to colony productivity 5.2 Explain the methods of queen bee rearing 5.3 Explain queen bee handling, marking, and introduction techniques	• Discuss queen bee biology and her importance to colony productivity • Explain the methods of queen bee rearing • Describe queen bee handling, marking, and introduction techniques	Whiteboard, projector, charts.	• Produce queen cells • Mark a queen bee • Introduce queens into new hives	Guide students to: • Graft larvae and harvest queen cells • Mark queen bees • Introduce queens into new hive.	Grafting tools, queen cups, cell-builder colony, marking pen, paint. Candy plugs
General Objective 6.0: Know harvesting and processing of hive products						
13-15	6.1 Explain harvesting of honey using hygiene practices. 6.2 Explain processing of secondary hive products. 6.3 Explain the cost–benefit analysis for honey production.	• Describe harvesting of honey using hygiene practices. • Describe processing of secondary hive products. • Describe the cost–benefit analysis for honey production.	Projector, white marker board, lecture notes.	• Hygienically harvest, bottle and label honey • Conduct the cost–benefit analysis of honey.	Guide students to: • Hygienically harvest, bottle and label honey. • Conduct the cost–benefit analysis of honey.	Hive frames, uncapping knife, extractor, jars, labels, and calculator.

COURSE ASSESSMENT:

Course work:	10%
Test/Assignments:	10%
Practical	40%
Examination:	40%
Total:	100%





VETERINARY TOXICOLOGY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: TITLE: VETERINARY TOXICOLOGY	COURSE CODE: ANH 421	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills of recognising, diagnosing and managing poisons in domestic animals common in Nigeria.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand principles of veterinary toxicology; 2.0 Understand inorganic poisons; 3.0 Understand organic and organophosphate poisons; 4.0 Understand chlorinated hydrocarbons; 5.0 Understand domestic, industrial and agrochemical poisoning; 5.0 Understand poisonous plants; 6.0 Understand mycotoxicoeses and miscellaneous poisons; 7.0 Understand environmental toxicology and chemistry.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: VETERINARY TOXICOLOGY			COURSE CODE: ANH 421		CONTACT HOURS: 3 HOURS/WEEK	
			CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: II			PRE-REQUISITE:		PRACTICAL: 2 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills of recognising, diagnosing and managing poisons in domestic animals common in Nigeria.						
GENERAL OBJECTIVE 1.0: Understand principles of veterinary toxicology						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1-2	1.1 Define toxicology. 1.2 Explain mean lethal dose and dose response 1.3 Explain poisoning diagnostic procedures	• Describe toxicology • Describe mean lethal dose and dose response • Discuss poisoning diagnostic procedures	Whiteboard Charts, projector, dose-response graphs.	• Take a structured toxicology history using a questionnaire template • Propose pathogenesis differentials and likely prognosis	Guide the students to: • Take a structured toxicology history using a questionnaire template • Propose pathogenesis differentials and likely prognosis	Case scenarios, history templates, structured questionnaire.
General Objective 2.0: Understand inorganic poisons						
3-4	2.1 Explain lead, calcium-EDTA antidote copper and arsenic 2.2 Explain diagnostic blood/ liver/ kidney levels. 2.3 Explain nitrate/ nitrite poisoning in ruminants	• Describe lead, calcium-EDTA antidote), copper and arsenic • Describe diagnostic blood/ liver/ kidney levels.	Charts, reference materials, whiteboard, projector.	• Carry out test on suspected samples for heavy metals • Conduct diphenylamine test for nitrate on feed and water samples,	Guide the students to: • Test suspected samples for heavy metals • Conduct diphenylamine test for nitrate on feed	Diphenylamine reagent, sulphuric acid, feed/ water samples, charts.

	from overfed wilted forages or fertilised crops. 2.4 Describe salt poisoning. 2.5 Describe urea poisoning in ruminants	• Describe nitrate/ nitrite poisoning in ruminants from overfed wilted forages or fertilised crops • Explain salt poisoning • Explain urea poisoning in ruminants		• Interpret results against reference levels.	and water samples, • Interpret results against reference levels.	
General Objective 3.0: Understand organic and organophosphate poisons						
5-6	3.1 Explain cyanide poisoning, bitter almond, sodium nitrite + sodium thiosulphate antidote protocol. 3.2 Explain organophosphate (OP) poisoning 3.3 Explain the differences in management between organophosphateP poisoning and carbamate poisoning	• Describe cyanide poisoning, bitter almond, sodium nitrite + sodium thiosulphate antidote protocol. • Describe organophosphate poisoning. • Describe the differences in management between Organophosphate poisoning and carbamate poisoning	Charts, reference materials, whiteboard, projector.	• Manage an OP-poisoning clinical scenario • Calculate the atropine dose and prepare the dose correctly from available stock. • Conduct the picrate paper test for cyanide on cassava chips	Guide the student to: • Manage an OP-poisoning clinical scenario • Calculate the atropine dose and prepare the dose correctly from available stock. • Conduct the picrate paper test for cyanide on cassava chips	Atropine, picrate paper, cassava, syringes, charts.
General Objective 4.0: Understand chlorinated hydrocarbons						
7-8	4.1 Explain chlorinated-hydrocarbon insecticides and their bioaccumulation 4.2 Explain poisoning diagnosis procedure	• Describe chlorinated-hydrocarbon insecticides and their	Charts, projector, referral references.	• Identify materials which contain chlorinated hydrocarbons, • Classify samples	Guide the students to; • Identify materials which contain chlorinated hydrocarbons,	Pesticide labels, NAFDAC reference list, charts.

	4.3 Explain first aid management and supportive care.	bioaccumulation • Describe poisoning diagnosis procedure • Discuss first aid management and supportive care.		according to NAFDAC/ WHO restriction status • Interpret recommended safer alternatives (MRL).	• Classify samples according to NAFDAC/ WHO restriction status • Interpret recommended safer alternatives (MRL).	
General Objective 5.0: Understand poisonous plants						
9-10	5.1 Explain major poisonous plants in Nigerian pastures 5.2 Explain the toxic principles by chemical class, the species most affected, and the characteristic clinical signs. 5.3 Outline prevention guidelines and treatment Care plan	• Describe the major poisonous plants in Nigerian pastures • Discuss the toxic principles by chemical class, the species most affected, and the characteristic clinical signs. • Outline prevention guidelines and treatment Care plan	Charts, projector, referral references.	• Identify 10 poisonous plants in a pasture survey.	Guide students to; • Identify at least 10 poisonous plants on pasture area.	Pasture site, ID guide, camera, sketch maps.
GENERAL OBJECTIVE 6.0: Understand mycotoxicoeses and miscellaneous poisons						
11-12	6.1 Explain the major mycotoxicosis 6.2 Explain miscellaneous poisons 6.3 Demonstrate detection methods 6.4 Outline prevention techniques.	• Describe the major mycotoxicosis • Describe miscellaneous poisons • Describe detection methods • Describe prevention	Charts, projector, referral references.	• Carry out aflatoxin lateral-flow test on a stored maize and groundnut • Interpret results against the 20 ppb regulatory limit.	Guide the students to: • Conduct aflatoxin lateral-flow test on a stored maize and groundnut • Interpret results against the 20 ppb regulatory limit.	Maize samples, groundnut, aflatoxin test strips, charts.

		techniques.				
GENERAL OBJECTIVE 7.0: Understand environmental toxicology						
13-15	7.1 Define Environmental Toxicology. 7.2 Explain Biothreats and Biomarkers. 7.3 Explain core principles of environmental chemistry. 7.4 Outline key types of environmental toxicants 7.5 Explain human and industrial factors in ecological degradation. 7.6 Explain the concept of keeping environment clean.	- Describe Environmental Toxicology. - Describe Biothreats and Biomarkers. - Describe core principles of environmental chemistry. - Describe key types of environmental toxicants and pollutants. - Describe human and industrial factors in ecological degradation. - Describe the concept of keeping environment clean.	Projector, white marker board, lecture notes.	- Carry out Environmental impact analysis. - Identify common biothreats and chemical pollutants. - identify 10 ecological degradation factors from surroundings. - Formulate Safer Ecology Protocols for records interpretation and keeping. - Interpret WHO References on Environmental Toxicology and Chemistry.	Guide the students to: - Conduct Environmental impact analysis. - Identify common biothreats and chemical pollutants. - Identify 10 ecological degradation factors from surroundings. - Formulate Safer Ecology Protocols for records interpretation and keeping. - Interpret WHO References on Environmental Toxicology and Chemistry.	Charts, Referrals, Sample organisms.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

CLINICAL TECHNIQUES II

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: CLINICAL TECHNIQUES II	COURSE CODE: ANH 422	CONTACT HOURS: 4 HOURS/WEEK
	CREDIT UNIT: 4	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 3 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills in clinical techniques.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand sedation, anaesthesia and post-operative care; 2.0 Understand common surgical conditions; 3.0 understand oestrus synchronization and heat detection; 4.0 Understand species-specific AI in cattle, small ruminants and swine; 5.0 Understand AI in poultry breeder birds; 6.0 Understand ultrasound pregnancy diagnosis and oestrus synchronization; 7.0 Understand piglet management protocols.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: CLINICAL TECHNIQUES II			COURSE CODE: ANH 422		CONTACT HOURS: 4 HOURS/WEEK	
			CREDIT UNIT: 4		THEORETICAL: 1 HOUR/WEEK	
YEAR: I SEMESTER: I			PRE-REQUISITE:		PRACTICAL: 3 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills in clinical techniques.						
GENERAL OBJECTIVE 1.0: Understand sedation, anaesthesia and post-operative care						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Explain sedation and anaesthesia agents. 1.2 Explain incision and suture techniques. 1.3 Explain Manage post-operative recovery.	•Describe sedation and anaesthesia agents. •Describe incision and suture techniques. •Describe post-operative recovery.	Charts, case photographs, projector, reference tec.	• Identify sedatives and anaesthetic agents • Perform Sedation and anaesthesia in animals • Perform incision and different suture techniques on models or animals. • Perform post-operative care	Guide students to; • Identify sedatives and anaesthetic agents • Perform Sedation and anaesthesia in animals. • Perform incision and different suture techniques on models or animals. • Perform post-operative care.	Suture phantoms, suture material, instruments, animals, models, PPE.
General Objective 2.0: understand common surgical conditions						
3-4	2.1 Explain alimentary and urinary surgical conditions.	•Describe alimentary and urinary surgical conditions.	Charts, case photographs, projector,	•Perform surgeries involving alimentary and urinary systems.	Guide students to: •Perform surgeries involving	Simulation models, animals,

	2.2 Explain reproductive surgical conditions. 2.3 Explain hernias and fractures.	• Describe reproductive surgical conditions. • Describe hernias and fractures.	whiteboard, internet.	• Perform surgeries involving reproductive system. • Perform hernioraphy and orthopaedic surgeries.	alimentary and urinary systems. • Perform surgeries involving reproductive system. • Perform hernioraphy and orthopaedic surgeries.	splints, bandages, lubricant, gloves, surgical kits, anaesthesia, infusion fluids, cotton wool methylated spirit, surgical lamp, PPE.
General Objective 3.0: Understand oestrus synchronization and heat detection.						
5-6	3.1 Explain oestrus synchronization protocols in different animal species. 3.2 list the synchronisation agents. 3.3 Explain heat detection techniques.	• Describe oestrus synchronization protocols in different animal species. • Enumerate the synchronisation agents. • Describe heat detection techniques.	Charts, case photographs, projector, whiteboard, internet.	• Identify different synchronisation agents • Perform oestrus synchronisation in live animal. • Identify and record the signs of heat in different animal species.	Guide student to; • Identify different synchronisation agents. • Perform oestrus synchronisation in live animal. • Identify and record the signs of heat in different animal species.	Live animals, synchronisation agents, heat detection aids.
General Objective 4.0: Understand species-specific Artificial Insemination (AI) in cattle, small ruminants and swine						
6-7	4.1 Explain cattle AI by recto-vaginal technique. 4.2 Explain AI in sheep and goat. 4.3 Explain AI in swine.	• Describe cattle AI by recto-vaginal technique. • Describe AI in sheep and goat. • Describe AI in swine.	Charts, case photographs, projector, whiteboard, internet.	• Collect, evaluate and preserve semen • Handle frozen semen • Load AI gun • Perform AI on at least one cow, one small ruminant and one sow	Guide students to; • Collect, evaluate and preserve semen • Handle frozen semen • Load AI gun	AI kits, semen, reproductive tracts (practice), artificial vagina, electro-ejaculator live

				Record the activities of the procedures.	- Perform AI on at least one cow, one small ruminant and one sow. - Record the activities of the procedures.	animals, Liquid Nitrogen canister, fresh egg, microscope, sodium citrate, distilled water, measuring cylinder, semen collection tube.
General Objective 5.0: Apply AI in poultry breeder birds						
8-10	5.1 Explain semen collection in poultry breeder males. 5.2 Explain semen evaluation and extension. 5.3 Describe the procedure for artificial insemination in hens.	- Explain semen collection in poultry breeder males. - Explain semen evaluation extension. - Explain the procedure for artificial insemination in hens.	Charts, projector, whiteboard, internet.	- Collect semen from a breeder male, - Evaluate the collected semen. - Dilute the collected semen. - Inseminate the hens, - Candle the eggs at 7 days.	Guide student to: - Collect semen from a breeder male, - Evaluate and dilute the collected semen, - Inseminate the hens, - Candle the eggs at 7 days	Poultry breeder males and hens, AI kit, extender, candler, charts, PPE.
GENERAL OBJECTIVE 6.0: Understand pregnancy diagnosis						
11-12	6.1 Explain the methods of pregnancy diagnosis. 6.2 Explain the use of ultrasound in pregnancy diagnosis. 6.3 Explain pregnancy diagnosis by rectal palpation in cow, camel and horse.	- Describe the methods of pregnancy diagnosis. - Describe the use of ultrasound in pregnancy diagnosis. - Describe pregnancy diagnosis by rectal	Charts, projector, whiteboard, internet.	- Perform hormonal assay for pregnancy diagnosis - Perform pregnancy diagnosis using ultrasound machine - Perform rectal palpation to diagnose	Guide students to; - Perform hormonal assay for pregnancy diagnosis - Perform pregnancy diagnosis using ultrasound	Ultrasound machine, obstetrical globe, lubricants, animals, record sheet, pregnancy test kits, ELISA

		palpation in cow, camel and horse.		pregnancy in cow, camel and horses.	machine • Perform rectal palpation to diagnose pregnancy in cow, camel and horses.	kits, syringes, charts, PPE
GENERAL OBJECTIVE 7.0: Understand piglet management protocols						
13-15	7.1 Explain farrowing and assisted farrowing. 7.2 Explain iron supplementation, fostering, castration, tail-docking. 7.3 Explain neonatal management.	• Describe farrowing and assisted farrowing. • Describe iron supplementation, fostering, castration, tail-docking, hipsdent (canine) teeth trimming. • Describe neonatal management.	Charts, projector, whiteboard, internet.	• Assist in farrowing • Perform castration, fostering, tail-docking and canine teeth trimming. • Carry out neonatal management.	Guide students to; • Assist in farrowing • Perform castration, fostering, tail-docking and canine teeth trimming. • Carry out neonatal management	In-sow and piglets, iron supplement, scalpel, sutures, antiseptics, ear-notcher, weighing scale, elastrator, log book.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

PHARMACOLOGY AND THERAPEUTICS II

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: PHARMACOLOGY AND THERAPEUTICS II	COURSE CODE: ANH 423	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: II	PRE-REQUISITE: PHARMACOLOGY AND THERAPEUTICS I	PRACTICAL: 2 HOUR/WEEK
GOAL: This course is designed to equip the students with the knowledge and Skills in pharmacology and Chemotherapeutics		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand cathartic, antidiarrhoeal and autonomic drugs; 2.0 Understand anti-inflammatory and cardiovascular drugs; 3.0 Understand fluid therapy and electrolyte balance; 4.0 Understand hormones and biological resources; 5.0 Understand euthanasia and AMR-stewardship reporting.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: PHARMACOLOGY AND THERAPEUTICS II			COURSE CODE: ANH 423		CONTACT HOURS: 3 HOURS/WEEK	
			CREDIT UNIT: 3		THEORETICAL: 1HOUR/WEEK	
YEAR: II SEMESTER: II			PRE-REQUISITE:		PRACTICAL: 2 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip the students with the knowledge and Skills in pharmacology and Chemotherapeutics						
GENERAL OBJECTIVE 1.0: Understand cathartic, anti-diarrheal and autonomic drugs						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Explain the classes of cathartic drugs used in veterinary practice. 1.2 Explain the classes of antidiarrheal drugs used in veterinary practice. 1.3 Explain the drugs influencing the autonomic nervous system (ANS) used in veterinary practice.	- Describe the classes of cathartic drugs used in veterinary practice. - Describe the classes of antidiarrheal drugs used in veterinary practice. - Describe the drugs influencing the autonomic nervous system used in veterinary practice.	Projector, white marker board, lecture notes.	- Identify different cathartic drugs - Identify commonly used antidiarrheal - Identify drugs influencing autonomic nervous system	Guide students to: - Identify different cathartic drugs - Identify commonly used antidiarrheal - Identify drugs influencing autonomic nervous system	Cathartic drug, antidiarrheal drugs, ANS drugs PPE, drug formulary,
General Objective 2.0: Understand anti-inflammatory and cardiovascular drugs						
3-5	2.1 Describe NSAIDs and corticosteroids.	Describe NSAIDs and corticosteroids.	Whiteboard, marker,	Identify NSAIDs drugs	Guide students to Identify NSAIDs	Samples of NSADs

	2.2 Describe digitalis group. 2.3 Describe diuretics drugs, group	- Describe digitalis group, of drugs - Describe diuretics drugs	internet, charts, projector.	- Identify digitalis drugs - Identify diuretics	drugs - Identify digitalis drugs - Identify diuretics	Drug, diuretics, digitalis, PPE
GENERAL OBJECTIVE 3.0: Understand fluid therapy and electrolyte balance						
6-9	3:1 Explain fluid types 3.2 Explain the indication of fluid therapy 3.3 Explain the rote routes of fluid administration	- Describe fluid types - Describe the indication of fluid therapy - Describe the routes of fluid administration	Projector, white marker board, lecture notes	- Identify different fluid types - Calculate the total fluid volume needed in 24 hours, - Set up the given sets appropriately, - Administer fluid therapy, to animal requiring fluid.	Guide students to: - Identify different fluid types - Calculate the total fluid volume needed in 24 hours, - Set up the given sets appropriately, - Administer fluid therapy, to animal requiring fluid.	Fluid bags, IV catheters, drip sets, syringes, charts, case animals, calculator, PPE
GENERAL OBJECTIVE 4.0: Understand hormones and biological resources						
10-12	4.1 Explain reproductive hormones. 4.2 Explain Metabolism and Excretion hormones 4.3 Explain biological resources 4.4 Explain handling, storage and administration of biological resources	- Describe reproductive hormones. - Describe Metabolism and Excretion hormones. - Describe biological resources - Describe handling, storage and administration of biological	Drug samples, vaccines, charts, projector.	- Identify different types of reproductive hormones and presentation - Identify different biological resources - Administer biological resources	Guide the students to: - Identify different types of reproductive hormones and presentation - Identify different biological resources - Administer biological resources	Assorted reproductive hormones, biological resources (toxoid, serum, vaccine, probiotics, anti-venom), PPE

		resources				
General Objective 5.0: Understand euthanasia and AMR-stewardship reporting						
13-15	5.1 Explain humane euthanasia methods. 5.2 Explain Antimicrobial Resistance 5.2 Explain AMR-stewardship reporting.	Describe the humane euthanasia methods. Explain Antimicrobial Resistance Explain AMR stewardship reporting.	Euthanasia agents, reporting templates, charts, projector.	• Identify drugs used in euthanasia • Euthanize an animal • Generate a sample one-month farm record of antimicrobial use • Complete the AMR-use log • Compute the total mg/kg biomass treated, and prepare a submission report in the FAO ATLAS format.	Guide students to • Identify drugs used in euthanasia • Euthanize an animal • Generate a sample one-month farm record of antimicrobial use • Complete the AMR-use log • Compute the total mg/kg biomass treated, and prepare a submission report in the FAO ATLAS format.	Farm records, animal, euthanizing agents, computer, calculator FAO-ATLAS, PPE
COURSE ASSESSMENT: Attendance – 10% Practical Performance – 50% Field Report/Logbook – 20% Examination/Viva – 20% Total = 100%						

VETERINARY JURISPRUDENCE

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: VETERINARY JURISPRUDENCE	COURSE CODE: ANH 424	CONTACT HOURS: 1 HOUR/WEEK
	CREDIT UNIT: 1	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: II	PRE-REQUISITE:	PRACTICAL:
GOAL: This course is designed to enable students with the knowledge of the laws, regulations and professional standards governing veterinary practice in Nigeria.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand veterinary-jurisprudence terms; 2.0 Understand the role of the Animal Health Technologist; 3.0 Understand Veterinary Laws and Acts; 4.0 Understand the structure of veterinary practice in Nigeria.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: VETERINARY JURISPRUDENCE			COURSE CODE: ANH 424		CONTACT HOURS: 1 HOUR/WEEK	
			CREDIT UNIT: 1		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: II			PRE-REQUISITE:		PRACTICAL: 0	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to enable students with the knowledge of the laws, regulations and professional standards governing veterinary practice in Nigeria.						
GENERAL OBJECTIVE 1.0: Understand veterinary-jurisprudence terms						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-3	1.1 Defineveterinary jurisprudence terms 1.2 Explain professional misconduct. 1.3 Explain disciplinary procedures and constitution of veterinary tribunal	• Discuss veterinary jurisprudence terms • Explain professional misconduct. • Discuss disciplinary procedures and constitution of veterinary tribunal	Charts, projector, legal texts, veterinary laws.			
General Objective 2.0: Understand the role of the Animal Health Technologist						
4-7	2.1 Explain the roles of the Animal Health Technologist in Nigeria 2.2 Describe the responsibilities of	• Explain the roles of the Animal Health Technologist in Nigeria	Job-description charts, projector.			

	2.3	Animal Health technologist in veterinary medical team Explain guiding principles in Animal Health practice	• Explain the responsibilities of animal health technologist in veterinary medical team • Explain guiding principles in Animal Health practice				
General Objective 3.0: Understand Veterinary Laws and Acts							
8-11	3.1	Explain Animal Diseases (Control) Act.	• Discuss Animal Diseases (Control) Act.	Legal documents, charts, projector.			
	3.2	Explain livestock Pests (Control of International Movement) Act	• Discuss livestock Pests (Control of International Movement) Act				
	3.3	Explain the Federal Republic Animal Welfare Bill	• Discuss the Federal Republic Animal Welfare Bill				
	3.4	Explain the Endangered Species (Conservation, Protection) Act	• Discuss the Endangered Species (Conservation, Protection) Act				
	3.5	Explain animal quarantine control post	• Discuss animal quarantine				
	3.6	Explain annual vaccination	• Discuss annual vaccination				

		- control post - Discuss annual vaccination				
General Objective 4.0: Understand the structure of veterinary practice in Nigeria						
12-15	4.1 Explain the roles of Federal, state and local governments in Veterinary practices in Nigeria 4.2 Explain the roles of private sector 4.3 Explain the structure for regulation of Animal Health professionals	- Explain the roles of Federal, state and local governments in Veterinary practices in Nigeria - Explain the roles of private sector - Explain the structure for regulation of Animal Health professionals	Projector, white marker board, lecture notes			
COURSE ASSESSMENT: Course work: 20% Test/Assignments: 20% Examination: 60% Total: 100%						

LIVESTOCK ENTERPRISE DEVELOPMENT AND AGRIBUSINESS

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: LIVESTOCK ENTERPRISE DEVELOPMENT AND AGRIBUSINESS	COURSE CODE: ANH 425	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills in entrepreneurship and agribusiness for the livestock value chain.		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand the livestock value chain; 2.0 Understand livestock business planning; 3.0 Understand agribusiness finance and livestock insurance; 4.0 Understand livestock cooperatives and their management; 5.0 Understand agri-digital marketing and off-take contracts.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: LIVESTOCK ENTERPRISE DEVELOPMENT AND AGRIBUSINESS				COURSE CODE: ANH 425		CONTACT HOURS: 3 HOURS/WEEK
				CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: II				PRE-REQUISITE:		PRACTICAL: 2 HOUR/WEEK
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills in entrepreneurship and agribusiness for the livestock value chain.						
GENERAL OBJECTIVE 1.0: Understand the livestock value chain						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1-2	1.1 Describe the Nigerian livestock value chain. 1.2 Describe the nodes of value creation. 1.3 Describe the specific entrepreneurial opportunities for the AHT graduate. 1.4 Describe livestock aggregation, logistics and market-linkage systems. 1.5 Describe disease outbreaks, price volatility, transport disruptions, feed shortages, market failures. 1.6 Describe entrepreneurship	• Explain the Nigerian livestock value chain. • Explain the nodes of value creation. • Explain the specific entrepreneurial opportunities for the AHT graduate. • Explain livestock aggregation, logistics and market-linkage systems. • Discuss disease outbreaks, price volatility, transport disruptions, feed shortages, market failures. • Discuss entrepreneurship	Value-chain diagrams, market-price data, projector.	• Map a specific livestock value chain with profit margin per node. • Collect market-price data for a livestock product and compare margins across value-chain actors. • Identify three livestock business opportunities that can be started using their Animal Health Technology skills. • Profile the identified livestock business opportunities.	Guide the students to: • Map a specific livestock value chain with profit margin per node. • Collect market-price data for a livestock product and compare margins across value-chain actors. • Identify and profile three livestock business opportunities that can be started using their Animal Health Technology skills.	Market price data, value-chain templates, calculator.

	opportunities available to Animal Health Technologists.	opportunities available to Animal Health Technologists.				
General Objective 2.0: Understand livestock business planning						
3-5	2.1 Describe the Business Model Canvas. 2.2 Explain the components of a livestock business model. 2.3 Describe basic financial projections for livestock enterprises. 2.4 Maintain simple production, sales and inventory records for a livestock enterprise. 2.5 Describe factors influencing enterprise selection. 2.6 Describe the steps involved in launching a livestock enterprise.	- Explain the Business Model Canvas (BMC). - Explain the components of a livestock business model. - Explain basic financial projections for livestock enterprises. - Explain simple production, sales and inventory records for a livestock enterprise. - Explain factors influencing enterprise selection. - Explain the steps involved in launching a livestock enterprise.	BMC templates, Excel, calculator, projector.	- Complete a one-page BMC for a chosen enterprise on a single A4 sheet, - Complete a three-year financial projection in Excel showing month-by-month cash flow with break-even point and have each student present in plenary. - Prepare simple livestock enterprise records for production cycle.	Guide students to: - Complete a one-page BMC for a chosen enterprise on a single A4 sheet, - Complete a three-year financial projection in Excel showing month-by-month cash flow with break-even Point and have each student present in plenary. - Prepare simple livestock enterprise records for production cycle.	BMC templates, Excel templates, calculators, 1-page Business Plan template.
General Objective 3.0: Understand agribusiness finance and livestock insurance						
6-7	3.1 Outline livestock financing sources.	Discuss livestock financing sources.	Loan application	Prepare a complete loan application for	Guide students to: Complete a	Loan templates, NAIC

	3.2 Describe loan application process. 3.3 Explain livestock-insurance products. 3.4 Describe financial records used in livestock enterprises.	- Discuss loan application process. - Explain livestock-insurance products. - Discuss financial records used in livestock enterprises.	templates, charts, projector, cashbook, income statement, simple balance sheet, enterprise performance records.	the BMC.	loan application package for their BMC	brochures, cashbook, income statement, simple balance sheet, enterprise performance records, computers.
General Objective 4.0: Understand livestock cooperatives and their management						
8-11	4.1 Describe cooperative principles and types. 4.2 Explain the legal-registration process. 4.3 Describe cooperative finance and governance. 4.4 Explain aggregation systems, cooperative input procurement, collective marketing, bulk sales and negotiation advantages.	- Explain cooperative principles and types. - Explain the legal-registration process. - Explain cooperative finance and governance. - Explain aggregation systems, cooperative input procurement, collective marketing, bulk sales and negotiation advantages.	Cooperative model documents, charts, projector.	Draft a cooperative by-law and a one-year work plan.	Guide students to: Form a model livestock cooperative (class members elect executive, draft by-law, open a notional savings account in Excel, run for one semester), and at the end of the practical evaluate functioning against good-governance criteria.	By-law templates, Excel for accounts, election papers.
General Objective 5.0: Understand agri-digital marketing and off-take contracts						

12-15	5.1 Explain agri-digital marketing. 5.2 Explain off-take and supply contracts. 5.3 Explain branding and packaging. 5.4 Explain customer relationship management in livestock enterprises. 5.5 Describe contract production and off-take arrangements in livestock enterprises.	• Explain agri-digital marketing. • Discuss off-take and supply contracts. • Explain branding and packaging. • Explain customer relationship management in livestock enterprises. • Discuss contract production and off-take arrangements in livestock enterprises.	Projector, white marker board, lecture notes.	• Build a one-week social-media campaign for their BMC • Draft an off-take contract for a hypothetical buyer. • Participate in a Livestock Enterprise Pitch Session. • Present their business concepts before a panel comprising lecturers, industry practitioners and financial-service providers..	Guide students to: • Build a one-week social-media campaign for their BMC • draft an off-take contract for a hypothetical buyer, with the lecturer reviewing each campaign and contract. • Organize a Livestock Enterprise Pitch Session where students present their business concepts before a panel comprising lecturers, industry practitioners and financial-service providers.	Smartphones, computers, contract templates, internet.
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COURSE ASSESSMENT:

Course work:	10%
Test/Assignments:	10%
Practical	40%
Examination:	40%
Total:	100%

ONE HEALTH AND VETERINARY EPIDEMIOLOGY

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY		
COURSE TITLE: ONE HEALTH AND VETERINARY EPIDEMIOLOGY	COURSE CODE: ANH 426	CONTACT HOURS: 3 HOURS/WEEK
	CREDIT UNIT: 3	THEORETICAL: 1 HOUR/WEEK
YEAR: II SEMESTER: II	PRE-REQUISITE:	PRACTICAL: 2 HOURS/WEEK
GOAL: This course is designed to equip students with knowledge and skills in One-Health, antimicrobial-stewardship and veterinary epidemiology		
GENERAL OBJECTIVES On completion of this course, the students should be able to: 1.0 Understand the One-Health concept; 2.0 Know priority Nigerian zoonoses; 3.0 Understand the antimicrobial-stewardship principles; 4.0 Understand the basic veterinary-epidemiology investigations; 5.0 Know the use of digital disease-surveillance tools; 6.0 Understand the application of outbreak-response protocols.		

PROGRAMME: HIGHER NATIONAL DIPLOMA IN ANIMAL HEALTH TECHNOLOGY						
COURSE TITLE: ONE HEALTH AND VETERINARY EPIDEMIOLOGY			COURSE CODE: ANH 426		CONTACT HOURS:3 HOURS/WEEK	
			CREDIT UNIT: 3		THEORETICAL: 1 HOUR/WEEK	
YEAR: II SEMESTER: II			PRE-REQUISITE:		PRACTICAL: 2 HOURS/WEEK	
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL						
GOAL: This course is designed to equip students with knowledge and skills on One-Health, antimicrobial-stewardship and veterinary epidemiology						
GENERAL OBJECTIVE 1.0: Understand the One-Health concept						
THEORETICAL CONTENT				PRACTICAL CONTENT		
Week	Specific Learning Outcome	Teacher’s Activities	Resources	Specific Learning Outcome	Teacher’s Activities	Resources
1	1.1 Define One Health. 1.2 Describe the human-animal-environment interface. 1.3 Outline One-Health stakeholders in Nigeria.	• Explain the concept of One Health. • Describe the human-animal-environment interface. • Describe the One-Health stakeholders in Nigeria.	Charts, NCDC publications, projector.			
General Objective 2.0: Know priority Nigerian zoonoses						
2-3	2.1 Describe zoonotic diseases. 2.2 Describe different classes of zoonotic diseases. 2.3 Describe emerging and re-emerging zoonoses.	• Explain zoonotic diseases. • Explain different classes of zoonotic diseases. • Discuss emerging and re-emerging	Charts, NCDC outbreak bulletins, projector.			

		zoonoses.				
General Objective 3.0: Understand the antimicrobial-stewardship principles						
4-6	3.1 Describe AMR stewardship principles 3.2 Describe the protocol for drug prescription audit. 3.3 Describe the rationale for drugs withdrawal periods.	• Explain AMR stewardship principles • Outline the protocols for drug prescription audit. • Explain the rationale for drugs withdrawal periods.	Drug labels, audit templates, charts, projector.	• Audit antimicrobial use on the institutional farm or clinic • Complete the audit template • Produce a recommendation for improvement	Guide students to: • Audit antimicrobial use on the institutional farm or clinic. • Complete the audit template • Produce a recommendation for improvement.	Farm records, audit templates, drug-residue charts.
General Objective 4.0: Understand the basic veterinary-epidemiology investigations						
7-9	4.1 Describe veterinary epidemiology terms. 4.2 Describe the protocols for outbreak investigation. 4.3 Describe basic study designs in epidemiology	• Explain veterinary epidemiology terms. • Outline the protocols for outbreak investigation. • Explain basic study designs in epidemiology	Epidemiology textbooks, charts, projector.	• Generate disease outbreak data sets • Complete the line listing, plot the epidemic curve, • Compute the attack rate and identify the most likely source, • Write the disease outbreak report.	Guide students to: • Generate disease outbreak data sets • Complete the line listing, plot the epidemic curve, • Compute the attack rate and identify the most likely source, • Write the disease outbreak report.	Simulated outbreak datasets, line-listing templates, Excel.
General Objective 5.0: Know the use of digital disease-surveillance tools.						
10-12	5.1 Describe national animal disease surveillance systems.	• Explain national animal disease surveillance	Projector, white marker board, lecture	• Build a syndromic-surveillance form and deploy to their phone,	Guide students to: • Build a syndromic-	Smartphones, ODK/KoBoToolbox, sample data.

	5.2 Describe animal disease surveillance reporting procedure 5.3 Explain WAHIS reporting.	systems. - Outline animal disease surveillance reporting procedure - Explain WAHIS reporting.	notes.	- Collect five simulated/real reports from the institutional farm, - View the cloud aggregations in a weekly summary	surveillance form and deploy to their phone, - Collect five simulated/real reports from the institutional farm, - View the cloud aggregations in a weekly summary.	
General Objective 6.0: Understand the application of outbreak-response protocols.						
13-15	6.1 Describe biosecurity and biosecurity zoning during outbreak. 6.2 Describe WOAHA outbreak-response guidelines. 6.3 Describe One-Health outbreak case study procedure	- Explain biosecurity and biosecurity zoning during outbreak. - Outline WOAHA outbreak-response guidelines. - Explain One-Health outbreak case study procedure	Projector, white marker board, lecture notes.	Prepare a One-Health outbreak case-study presentation.	Guide students to Prepare a One-Health outbreak case-study presentation	Outbreak data, computers, projector, presentation rubric.
COURSE ASSESSMENT: Course work: 10% Test/Assignments: 10% Practical 40% Examination: 40% Total: 100%						

LIST OF MINIMUM RESOURCES/PHYSICAL FACILITIES

LABORATORIES

1. GENERAL BIOLOGY/MICROBIOLOGY/PATHOLOGY/PARASITOLOGY

S/N	ITEMS	QUANTITY
1.	Autoclave	1
2.	Refrigerator	1
3.	Platinum wire loops	30
4.	Incubator	1
5.	Anaerobic jar	2
6.	Lovibond colour comparators	2
7.	Colony counter	1
8.	Centrifuge	1
9.	Water bath	1
10.	Electronic balance	2
11.	Microscopes Simple Compound	5 5
12.	Staining troughs	15
13.	Magnifying glasses	15
14.	Insect cages and cabinets	5
15.	Specimen bottles	20
16.	Insect nets	30
17.	Lamps	10
18.	Mist nets	10
19.	Cool boxes	10
20.	Oven	1

2. GENERAL CHEMISTRY

S/N	ITEMS	QUANTITY
1.	Centrifuge (Electric/ manual)	2

2.	Water bath (with rings and thermostat)	1 each
3.	Kipps Apparatus	1
4.	Column chromatograph / High Performance Liquid chromatograph (HPLC)	2
5.	Distillation apparatus	2
6.	Flame photometer	1
7.	Flame cupboard	2
8.	Hot plate	2
9.	Oven (Electric)	2
10.	Spectrophotometer (uv)	1
11.	Bunsen burner	30
12.	Electrophoresis equipment	1
13.	Manesty water distiller	1
14.	Vacuum pump	1
15.	Magnetic stirrer	2
16.	Rotary shaker	1
17.	Thermometer	20
18.	Heating mantle	2
19.	Khajeldhal Apparatus	1
20.	Paper chromatograph	2
21.	pH meter	2
22.	Balance (top Loading)	5
23.	Distillation apparatus	2
24.	Bomb Calorimeter	1
25.	Water sterilizer	1
26.	Soxhlet extraction apparatus	1
27.	Lovibond comparator	1
28.	Flash point	1
29.	Voltammeter (H-type/copper)	2 each
30.	Centrifuge	1
31.	Chemical balance	2
32.	Desiccator	2

33.	Pestle and mortar	2
34.	Flask shaker	2
35.	Grinder/blender	1
36.	Colorimeter	1

3. ANATOMY AND PHYSIOLOGY LABORATORY

A. Anatomy Laboratory

S/N	ITEM	QUANTITY
1.	Model of the cow approx. 1/3 natural size showing muscles and with detachable entrails such as ½ lung, heart, intestines ruminant stomach.	2
2.	Model of sow approx. ½ natural size showing muscles and with detachable entrails.	2
3.	Model of domestic fowl natural size showing internal detachable organs.	4
4.	Models illustrating development of animals e.g. cell division.	4 sets
5.	Models of the vertebrates individually mounted on stands with base.	7 models (one each)
6.	Mounted skeletons of: Bovine, Equine, Canine, Caprine, Avian, Napine, Reptiles	1 complete skeleton of each species (7 total)
7.	Collections of the following bones of mammals, avian and reptiles. Bony pelvis, Scapula, Skull, Ossa Coxarum, Humerus, Atlas, Os Caxae, Radius and Ulna, Axis, Femur Carpals, Typical cervical vertebrae, Tibia and Fibula, Metacarpals, Thoracic “ Tarsals Lumber “ Metatarsals, Sacral “ Phalanges, Coccygeal “ Ribs, Sternum	2 complete sets
8.	Microscopes	40
9.	Prepared histology slide showing: (i) Cell division (ii) Formation of germ layers, - Epithelia/tissues, - Connective tissues Slides - Muscular tissue - Nervous tissue - Small intestine - Large intestine	2 complete sets (minimum of 20-25 slide per set).

	- Liver - Spleen - Pancreas - Lymph nodes - Salivary glands - Arteries - Veins - Kidney - Ovary - Trachea	
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B. Physiology Laboratory

S/N	ITEMS	QUANTITY
1.	Balance (top loading)	3
2.	Centrifuge (electric and buckets)	2
3.	Column chromatograph	1
4.	Distillation apparatus	2
5.	Flame photometer	1
6.	Heating mantle	2
7.	Hot plate	2
8.	Khejedahl apparatus	1
9.	Spectrophotometer	1
10.	Spirometer	1
11.	Stethoscope	6
12.	Electrocardiogram (ECG)	1
13.	Kips apparatus	2
14.	Lovibond comparator	1
15.	Muffle furnance	1

16.	Paper chromatograph apparatus	1
17.	Rotary vacuum evaporator	1
18.	Soxhlet apparatus	1
19.	Thaermostated water bath	1
20.	Thermometers	6
21.	Thin layer chromatography	1
22.	Vacuum dry oven	1
23.	Vacuum pump	1
24.	Water bath with eccentric rings	1
25.	Water deioniser	1

C. PHARMACOLOGY/TOXICOLOGY LABORATORY

S/N	ITEM	QUANTITY
1.	Anaerobic jar	2
2.	Animal cages	3
3.	Aquarium	2
4.	Autoclave	2
5.	Blender	2
6.	Blood grouping kit	10
7.	Projector	1
8.	Cabinet for microscope	3
9.	Centrifuge	2
10.	Centrifuge (Electric and buckets)	2
11.	Clinostat clock	5
12.	CO2 gas cylinder with gas	10
13.	Colony counter	2
14.	Column chromatograph	4
15.	Desiccator	1
16.	Dissecting microscope	4

17.	Dissecting board or trays with wax	30
18.	Dissecting kits	2
19.	Electronic analytical balance	2
20.	Football bladder	12
21.	Forceps	2
22.	Freezer	2
23.	Glass still distiller	5
24.	Haematocrit centrifuge	10
25.	Haemocytometer	10
26.	Haemoglobinometer	5
27.	Heating mantle	2
28.	Hot air Oven	2
29.	Hot plate	2
30.	Ice coolant	1
31.	Incubating hood	2
32.	Incubator	2
33.	Inoculating chamber	10
34.	Inoculating loop holder	1
35.	Inoculation hood	10
36.	Insect cages	12
37.	Insect cages and cabinets	2
38.	Lovibond colour comparators	1
39.	Lyophilisation (freeze drying) equipment	20
40.	Magnifier (hand lens)	3
41.	Manesty still	1
42.	Mettler balance (milligred)	1
43.	Mettler balance (top loading) big	1
44.	Mettle balance (top loading) small -Microscope	1

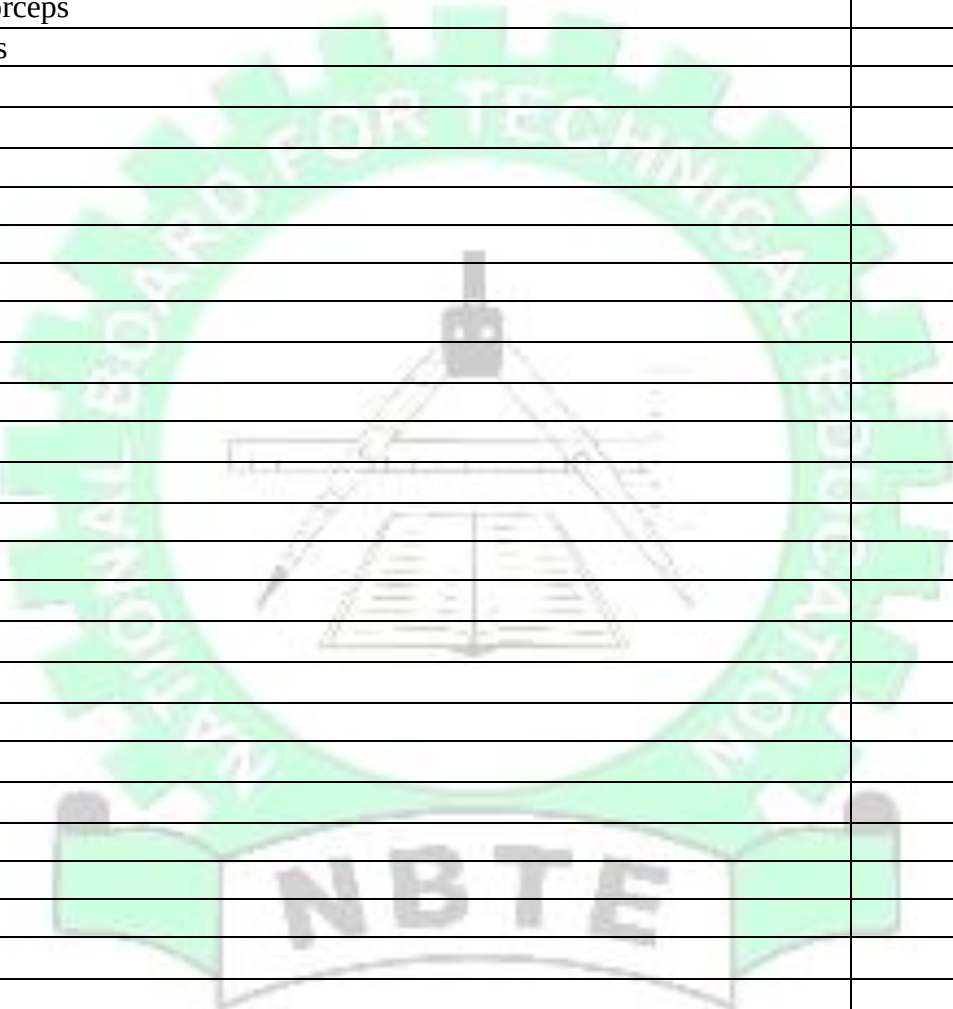
	-Monocular -Binocular	
45.	Microtome	1
46.	Microtome and knives	2
47.	Milk sampling outfit	5
48.	Net burry(insect nets)	2
49.	Insects pins	6
50.	Oven thermometer and electric	5
51.	PH meter	2
52.	Photometer	10
53.	Photosynthesis Apparatus	Assorted
54.	Platinum wire loops	All class of endo- and ecto- parasites
55.	Preserved specimen of diseased Livestock tissues	1 from each specie
56.	Preserved specimen of various Livestock parasites	1
57.	Preserved specimen of whole Diseased animals	2
58.	Projecting microscope	2
59.	Refrigerator	5
60.	Deep freezer	120
61.	Respirometer	1
62.	Sampling bottles	6
63.	Shaker for battle	5 sets
64.	Shaker for Rbc and Wb	10
65.	Soil sieves (various sizes)	3
66.	Soil test kit	6
67.	Sprinkler	1
68.	Staining troughs	30
69.	Sterilizer	10
70.	Thermometer (Assorted)	10
71.	Tissue processing bottle	2

72.	Tissue processing holder	1
73.	Top loading balance	1
74.	Triple beam balance	2
75.	Ultraviolet light	2
76.	Vacuum pump	2
77.	Water bath	2
78.	Water bath (with electronic rings)	1
79.	Wax dispenser	10
80.	Wax embedding oven	1
81.	Inoculating loop holder	
82.	Inoculation hood	

D. VETERINARY CLINIC

S/N	ITEMS	QUANTITY
1.	Air conditioner (3 outdoor and 3 indoor units)	6
2.	New Cline Deep Freezer	3
3.	Cooking pots	3 sets
4.	15 Litres Knapsack Sprayer (Steel)	5
5.	20 Litres Knapsack Sprayer (Plastic)	2
6.	Suction Machine (Double Bottle)	5
7.	Theatre Lamp	2
8.	Kidney Dishes and Covers	20
9.	Bowls	20
10.	Hospital Trays and Covers (Large size)	20
11.	Hospital Trays and Covers (Medium size)	20
12.	Hospital Trays and Covers (Small size)	20
13.	pH/ Temperature Metre	5
14.	Micro-haematocrit Centrifuge	6
15.	Endo-tracheal Tube	10
16.	XD-301 Cold Light Source	1
17.	Heating Cabinet Incubator	4

18.	Electric Dehorers	4
19.	Plexi Vaginal Light Spectrum	3
20.	Elizabeth Collars (3 large, 2 medium and 3 small sizes)	8
21.	Veterinary Ophthalmoscopes	5
22.	Microscopes	3
23.	Refractometre	3
24.	Gastroscope	2
25.	Hoof knives	4 packs (23 pieces)
26.	Walk-on-weighing scale	4
27.	Anaesthetic Machine (1 accessory for another machine)	3
28.	Video Otoscope	2
29.	Stomach Tubes	3
30.	Dog Catchers	9
31.	Electrolytes Analyzer	1
32.	Hematology Analyzer	1
33.	Biochemistry Analyzer	1
34.	Stainless-steel Electric Heating Disinfecting Apparatus	1
35.	Haematocrit tubes	6 packets
36.	Portable Hoof Trimmers	1
37.	Fiberscope	1
38.	Electric Dehorner	2
39.	Beakers (250 mls)	9
40.	Infusion Sets	12
41.	Syringes (5mls, 10mls, 20mls)	2 packs each of 100
42.	Artery forceps	10
43.	Tissue forceps	10
44.	Thumb forceps	10
45.	Uterine holding forceps	10
46.	Alligator forceps	10
47.	Dissecting forceps	10



48.	Peritoneum forceps	10
49.	Intestinal forceps	5
50.	Rat-Toothed mosquito forceps	5
51.	Mosquito straight forceps	10
52.	Umbilical O. forceps	5
53.	Curved forceps	5
54.	Allis tissue forceps	3
55.	Sterilizer forceps	3
56.	Towel clips	3
57.	Obstetric hooks	3
58.	Surgery table	5
59.	Examination lamps	5
60.	Emasculator	5
61.	Examination table	5
62.	Pig catcher	2
63.	Probang	2
64.	Diagnostic set	1
65.	Post mortem kit	1
66.	Light duty cautery	1
67.	Uterine catheter	1
68.	Aural speculum	2
69.	Vaginal speculum	2
70.	Trocar and canula	3
71.	Bloodless castrator	2
72.	Automatic vaccinator	2
73.	Ligature scissors	2
74.	Multi-dose syringes	2
75.	Grooved director	4
76.	Clinical knife	2
77.	Surgical needles	3

78.	Surgical saw	5
79.	Surgical trays with lid (M,L)	5
80.	Obstetrical instruments	2
81.	Debeaker	Assorted
82.	Drencher (sheep.cattle)	Assorted
83.	Oxygen cylinders	2
84.	Otoscope	2
85.	Stethoscopes	2
86.	Thermometers	12
87.	Autoclave	3
88.	Steam sterilizer	1
89.	Refrigerator	3



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