FEDERAL MINISTRY OF EDUCATION

National Technical Certificate (NTC) Curriculum in

LIVESTOCK PRODUCTION

February, 2025

Innovation Development and Effectiveness in the Acquisition of Skills (IDEAS) Project

Funded by IDEAS project

NATIONAL BOARD FOR TECHNICAL EDUCATION

Plot B, Bida Road, P.M.B. 2239, Kaduna, Nigeria

NATIONAL TECHNICAL CERTIFICATE

CURRICULUM & COURSE SPECIFICATION

IN

LIVESTOCK PRODUCTION

2025

General Information

AIM:
To give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self –reliant.

ENTRY QUALIFICATIONS

CRAFT PROGRAMME
Candidates must not be less than 14 years of age and should have successfully completed three years of junior secondary education or its equivalent. Special consideration may be given to sponsored candidates with lower academic qualifications who hold trade test certificates and are capable of benefiting from the programme.

THE CURRICULUM
The Curriculum of each programme is broadly divided into three components:

a General Education, which accounts for 30% of the total hours required for the programme
b Trade Theory, Trade Practice and Related Studies which account for 65% and
c Supervised Industrial Training/Work Experience, which accounts for about 5% of the total hours required for the programme. This component of the course which may be taken in industry or in college production unit is compulsory for the full-time students.

Included in the curriculum, for the guidance of the teacher are the teacher's activity and learning resources required.

Unit Course/Module
A Course/Module is defined as a body of knowledge and skills capable of being utilized on its own or as a foundation or pre-requisite knowledge for more advanced work in the same or other fields of study. Each trade when successfully completed can be used for employment purposes.

BEHAVIOURAL OBJECTIVES

These are educational objectives which identify precisely the type of behaviour a student should exhibit at the end of a course/module or programme. Two types of behavioural objectives have been used in the curriculum. They are:

a. General Objectives
b. Specific learning outcomes

General Objectives are concise but general statements of the behaviour of the students on completion of a unit of work such as understanding the principles and application.

a. Orthographic projection in engineering/technical drawing
b. Loci in Mathematics
c. Basic concepts of politics and government in Political Science
d. Demand and Supply in Economics

Specific Learning outcomes are concise statements of the specific behaviour expressed in units of discrete practical tasks and related knowledge the students should demonstrate as a result of the educational process to ascertain that the general objectives or course/programme have been achieved. They are more discrete and quantitative expressions of the scope of the tasks contained in a teaching unit.

GENERAL EDUCATION IN TECHNICAL COLLEGES

The General Education component of the curriculum aims at providing the students with complete secondary education in critical subjects like English Language, Economics, Physics, Chemistry, Biology, Entrepreneurial Studies, Geography and Mathematics to enhance the understanding of machines, tools and materials of their trades and their application and as a foundation for post-secondary technical education for the above average students. Hence, it is hoped that studentss who successfully complete their trade and general education may be able to compete with their secondary school counterparts for direct entry into the polytechnics or colleges of education (Technical) for ND or NCE courses respectively. The Social Studies component is designed to broaden the students's social skills and his understanding his environment.

For purpose of certification, only the first three courses in Mathematics will be required. The remaining modules are optional and are designed for the above average students.

National Certificate
The NTC programmes are run by Technical Colleges accredited by NBTE

NABTEB conducts the final national examination and awards certificates to successful candidate.

Studentss who successfully complete all the courses/modules specified in the curriculum table and passed the national examinations in the trade will be awarded the following certificates

S/NO	LEVEL	CERTIFICATE
	Technical Programme	
1	Craft Level	National Technical Certificate

Guidance Notes for Teachers Teaching the Curriculum
The number of hours stated in the curriculum table may be increased or decreased to suit individual institution's timetable provided the entire course content is properly covered and the goals and objectives of each module are achieved at the end of the term.

The maximum duration of any module in the new scheme is 300 hours. This means that for a term of 15 weeks, the course should be offered for 20 hours a week. This can be scheduled in sessions of 4 hours in a day leaving the remaining hours for general education. However, (properly organised and if there are adequate resources), most of these courses can be offered in two sessions a day, one in the morning and the other one in the afternoon. In so doing, some of these programmes may be completed in lesser number of years than at present.

Each session of 4 hours include the trade theory and practice. It is left for the teacher to decide where the class should be held, in the workshop or in a lecture room.

INTEGRATED APPROACH IN THE TEACHING OF TRADE.

Theory, Trade Science and Trade Calculation

The traditional approach of teaching trade science and trade calculation as separate and distinct subjects in technical college programmes is not relevant to the new programme as it will amount to a duplication of the teaching of mathematics and the physical science subjects in the course. The basic concepts and principles in mathematics and physical science are the same as in the trade calculation and trade science in the new scheme. therefore, mathematics and the physical science will be taught by qualified persons in these fields and the instructors will apply the principles and concepts in solving trade science and calculation problems in the trade theory classes. To this end, efforts have to be made to ensure that mathematics and science modules required to be able to solve technical problems were taken as pre-requisite to the trade module.

Evaluation of Programme/Module

For the programme to achieve its objectives, any course started at the beginning of a term must terminate at the end of the term.

Instructors should therefore device methods of accurately assessing the students to enable them give the student's final grades at the end of the term. A national examination will be taken by all students who have successfully completed their modules. The final award will be based on the aggregate of the scores attained in course work and the national examination.

CURRICULUM TABLE AND COURSE HOURS/WEEK

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE PROGRAMME IN LIVESTOCK PRODUCTION

Module Code	**MODULE**	**YEAR I**						**YEAR 2**						**YEAR 3**						**TOTAL HOURS**
		Term 1		Term 2		Term 3		*Term 1*		Term 2		Term3		Term 1		Term 2		Term 3		
		T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	
CMA 12-15	MATHEMATICS	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	216
CEN 11-17	ENGLISH	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	216
CPH 10-12	PHYSIC	2	-	2	-	2	-	2	1	2	1	2	1	2	1	2	1	2	1	288
CCH11 -12	CHEMISTRY	2	-	2	-	2	-	2	1	2	1	2	1	2	1	2	1	2	1	288
CEC 11-13	ECONOMICS	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	216
ICT 11-15	COMPUTER	-	-	-	-	-	-	1	2	1	2	1	2	1	2	1	2	-	-	180
CRD 11-13	TECH.DRAWING	-	3	-	3	-	3	-	3	-	3	-	3	-	2	-	2	-	2	288

CBM 11	ENTERPRENUE SHIP	-	-	-	-	-	-	2	-	2	-	2	-	-	-	-	-	-	-	72
CLP111	INTRODUCTION TO LIVESTOCK PRODUCTION	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
CPP121	INTRODUCTION TO POULTRY PRODUCTION I	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
CAH121	SHEEP AND GOAT PRODUCTION I	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
CAH122	CATTLE PRODUCTION I	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
CFT 121	INTRODUCTION TO FISHERIES TECHNOLOGY	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
CAH133	RABBIT PRODUCTION I	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	48
CAH134	INTRODUCTION TO SWINE PRODUCTION I	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	48
CFT132	INTRODUCTION TO BASIC AQUACULTURE	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	48
CBK 131	INTRODUCTION TO BEEKEEPING PRACTICE	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	48
CPP211	POULTRY PRODUCTION II	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	48
CAH211	SHEEP AND GOAT	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	48

	PRODUCTION II																			
CAH212	CATTLE PRODUCTION II	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	48
CAH223	RABBIT PRODUCTION II	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	48
CAH224	SWINE PRODUCTION II	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	48
CFT221	FISHING GEAR AND CRAFT TECHNOLOGY	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	48
CFT232	INTRODUCTION TO FISH FARM ENGINEERING	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	48
CBK231	INTRODUCTION TO BEEKEEPING METHOD, HIVES AND APIARY MANAGEMENT	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	48
CPP311	POULTRY PRODUCTION III	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	48
CAH311	SHEEP AND GOAT PRODUCTION III	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	48
CAH312	CATTLE PRODUCTION III	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	48
CAH323	RABBIT PRODUCTION III	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	48
CAH324	SWINE PRODUCTION III	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	36
CFT331	INTRODUCTION TO POST HARVEST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	48

	TECHNOLOGY AND MARKETTING																			
CBK331	INTRODUCTION TO BEE PEST, PREDATORS, DISEASES, HONEY HARVESTING AND PACKAGING	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	48
	TOTAL	12	5	18	11	18	11	19	13	19	13	17	11	17	12	15	9	14	8	2904

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<tr><td colspan="2">MODULE: INTRODUCTION TO LIVESTOCK PRODUCTION TECHNOLOGY</td><td>COURSE CODE: CLP 111</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 1</td><td>TERM: 1</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to the general overview of livestock production</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0: understand the importance of livestock production
2.0 : understand livestock production systems
3.0 : understand feeds and feeding requirements for livestock
4.0 : understand feed quality ,safety and storage</td></tr>
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PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: INTRODUCTION TO LIVESTOCK PRODUCTION				**CODE: CLP111**	**CONTACT HOURS:48 Hours**	
COURSE SPECIFICATION :THEORITICAL CONTENT 24 Hours				**PRACTICAL CONTENT: 24 Hours**		
	GENERAL OBJECTIVE 1.0: UNDERSTAND THE IMPORTANCE OF LIVESTOCK PRODUCTION					
WEEK	SPECEFIC LEARNING OBJECTIVES	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECEFIC LEARNING OBJECTIVES	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-2	1.1 Introduction to livestock production	Explain livestock production	Textbooks, e-library.	Identification of different types of livestock	Guide students to identify different types of livestock	Farm and livestock market visits, charts, pictures, textbooks and diagrams.
	1.2 importance of livestock production	Explain the economic importance of livestock production		Outline the importance of livestock production	Support the student to know importance of livestock production	
2- 3	1.3 understand the merits & demerits of livestock production	State the merits & demerits of livestock production				
	1.4 Describe and Classify livestock	Outline the classification of livestock on digestion (Ruminants and non-ruminants), habitat,(terrestrial & aquatic), size (small & large), feeding habit.	Textbooks, e-library.	Describe the classification of livestock based on digestion (Ruminants and non-ruminants), habitat,(terrestrial & aquatic), size (small & large), feeding habit.	Outline the classification of livestock based on on digestion(Ruminants and non-ruminants), habitat,(terrestrial & aquatic), size (small & large), feeding habit.	Farm and Abattoir Visits
	General Objective 2.0 : Understand livestock production systems					
4-5	2.1 Discuss different system of livestock production	Explain different types of livestock production system(intensive, semi intensive and extensive/commercial		Identification of different types of livestock production system	Guide students on the identification different livestock production system	Farm Visit, Use of audio visuals and documentaries.

		and non-commercial)				
	2.2 State the advantages and disadvantages of each system	Specify the different advantages and disadvantages of the systems				
	General Objective 3.0 : Understand feeds and feeding requirements for livestock					
6 - 7	3.1 Introduction to basic livestock nutrition and	Explain the Nutritional Composition of the feeds		Identify the different feed ingredients.	Guide the students on the identification of different feed ingredients.	Visit to feed mills
	3.2 Explain different processing methods involved in livestock feed production	Discuss the different processing methods involved in livestock feed production		Carry out various processing methods in livestock feed ingredients	Guide students to carry out various processing methods in livestock feed ingredients	Soya bean, ground nut, pan, available source of heat. Etc.
	General Objective 4.0 : Understand Feed Quality ,Safety and Storage					
8 - 10	Categorize feed ingredients according to their sources.	Describe feed ingredients(sources of protein, carbohydrate ,vitamins, minerals)etc.		Identify feed ingredients. Classify sources of feed ingredients.	Guide students on the identification of feed ingredients. Demonstrate the classification of feed ingredients	Market and Feed mill Visit
11-12	Know methods of feed storage	State the different methods of feed storage(traditional and modern)		Identify various methods of feed storage(traditional and modern)	Guide students on the identification of various methods of feed storage.	Village and store visits

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: INTRODUCTION TO POULTRY PRODUCTION I		**COURSE CODE:CPP 121**	**CONTACT HOURS:48**
YEAR: 1	**TERM:** 1	**PRE: REQUISITE:**	**Theoretical: 24 Hours** **Practical: 24 Hours**
GOAL: This module is designed to introduce the students to the general overview of poultry production			

GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0: Understand the Importance of poultry keeping.
2.0: Understand various poultry species.
3.0: Know the management systems in poultry
4.0: Know the importance of housing in poultry.
5.0: Understand the various nutrients required in poultry feeding.
6.0: Know the importance of hygiene in poultry keeping.

MODULE: INTRODUCTION TO POULTRY PRODUCTION I				**CODE: CPP 121**	**CONTACT HOURS: 48Hours**	
COURSE SPECIFICATION : THEORITICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	GENERAL OBJECTIVE 1.0: Understand the Importance of poultry keeping.					
WEEK	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Enumerate the importance of poultry to the farmer and society.	Discuss the economic importance of poultry production				
	General Objective 2.0: Understand various poultry species.					
	2.1 Describe the external features of chicken (fowl). 2.2 Describe the external features of turkey. 2.3 Describe the external features of pigeon. 2.4 Describe the external features of ostrich etc.	Explain the external features of some poultry species in 2.1 – 2.4.		Identify the external features of different poultry birds.	Guide students on the identification of poultry birds using external features.	
	General Objective 3.0: Know the management systems in poultry					
	3.1 Describe various poultry raising systems. 3.2 Free range (extensive) 3.3 Semi intensive 3.4 Intensive	Explain the keeping/raising systems of poultry as in 3.2 – 3.4.		Carry out physical identification of various raising systems.	Guide students to carry out physical identification of various raising systems	Community/ Poultry Farm Visit

	General Objective 4.0: Know the importance of housing in poultry.					
	4.1 Explain types of housing for poultry in the tropics. 4.2 State importance of housing in poultry. 4.3 Identify raw materials use in building poultry houses. 4.4 Name some common facilities in a poultry farm and state their uses; e.g. wheel barrow, shovel, head pan, crates, nesting box, drinker feeder, weighing balance, etc.	Discuss the importance of good poultry housing. Explain conventional and non- conventional housing and show examples.		Identify building materials available in the locality Identify farm equipment and their uses	Guide students on identifying building materials available in the locality.	Sketches of poultry housing Display the equipment in poultry housing
	General Objective 5.0: Understand the various nutrients required in poultry feeding.					
	5.1 Discuss the nutrients required by the various classes of poultry. Carbohydrate, Protein, Fat/oil, Vitamins Minerals. 5.2 Discuss the sources of these nutrients e.g. Carbohydrates maize, Sorghum, millet, cassava, yam; etc. , protein, soya bean, groundnut, cotton seed and palm kernel cakes, fish meal; etc. 5.3 Discuss the importance of these nutrients to the overall performance of Poultry.	Explain 5.1 – 5.3.		Know different nutrient composition and sources of feed ingredients	Guide students on nutrient composition and their sources	Feed mill

	General Objective 6.0: Know the importance of hygiene in poultry keeping.					
6.1 **6.2** **6.3**	Describe the importance of clean environment. Discuss effects of parasites in poultry. Describe types and importance of vaccinations.	Explain the need for clean environment in poultry raising. Explain effects of parasites in poultry. Explain types and importance of vaccinations.		Identification of equipment in a poultry house.	Assist students to Identify equipment in a poultry house.	Poultrypen, drinkers, feeding trough,litter, dewormer, detergent and disinfectant

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: SHEEP AND GOAT PRODUCTION I</td><td>COURSE CODE:CAH 121</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 1</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td><td>TERM: 2</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to the general overview of sheep and goats production</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:
On completion of this module, the students should be able to:

1.0: Know the importance of sheep and goats.
2.0 Understand the breeds of sheep and goats
3.0 Understand the management systems of Sheep and goats
4.0 Understand the different housing for sheep and goats
5.0 Know the Good management practices of sheep and goats</td></tr>
</table>

PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: SHEEP AND GOATS PRODUCTION I				**CODE: CAH 121**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION : THEORITICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	General Objective 1.0: Know the importance of sheep and goats.					
WEEK	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Explain the importance of sheep and goats. 1.2 State the economic benefit of sheep and goats. 1.3 Discuss the social benefits of sheep and goats rearing.	List the importance of sheep and goats. Explain the economic benefits of sheep and goats. Highlight the economic benefits of sheep and goats rearing				
	General Objective 2.0: Understand the breeds of Sheep and goats.					
	2.1 Describe the breeds of sheep. 2.2 Describe the breeds of goats. 2.3 Distinguish between sheep and goats.	Explain 2.1 and 2.2. Differentiate between sheep and goats.		Identify the breeds of sheep. Identify the breeds of goats.	Guide students on the identification of sheep and goats.	Charts, farm and market visit, audio visuals. etc.

	General Objective 3.0: Understand the management systems of Sheep and goats.					
	3.1 Describe Free range (extensive) management system. 3.2 Describe Semi – Intensive management system. 3.3 Describe Intensive management system.	Explain 3.1 – 3.3.		Identify the common management systems.	Guide students on identifying various management systems.	
	General Objective 4.0: Understand the different housing for sheep and goats.					
	4.1 Explain types of sheep and goats housing. 4.2 Discuss the types of housing for sheep and goats e.g. traditional and modern housing. 4.3 State the importance of housing for sheep and goats.	Describe the features of a good housing for sheep and goats e.g. huts, bamboo and pen/paddocks. Describe the features of good housing and enumerate the materials available for the construction Discuss the facilities in sheep and goats house e.g. drinkers, feeders, head pan; etc. Discuss the different types of bedding materials used in sheep and goat production		Identifying local raw materials used for the construction of sheep and goats house. Identifying facilities in sheep and goats house E.g. drinkers, feeders, head pan; etc. Identifying the types of bedding materials used for sheep and goats.	Show students different types of feeder and drinkers for sheep and goats. Guide students to Identify facilities in sheep and goat e.g. drinkers ,feeders ,head pan Show different types of bedding materials used in sheep and goat production	Bamboo or wood shaving, Thatch, straw.etc. Visit to sheep and goat farm Farm visit

	General Objective 5.0: Know the Good management practices of sheep and Goats					
	5.1 Describe the importance of clean environment for the growth of sheep and goats, e.g. ventilation, good drinking water, clean troughs etc. 5.2 State the importance of vaccination. 5.3 List the various types and the method of vaccine administration	Discuss the importance of clean environment for the growth of sheep and goats, e.g. ventilation, good drinking water, clean troughs etc. Describe the importance of vaccination. Explain the different types of sheep/goats vaccination and show how it could be administered.		Carry out good management practices of sheep and goats. Identify the different types of sheep/goats vaccines.	Show student on good management practices of sheep and goats. Show students different vaccines of sheep and goats.	Visit to veterinary premises Farm Visit

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<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: CATTLE PRODUCTION I</td><td>COURSE CODE: CAH122</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 1</td><td>TERM: 2</td><td>PRE-REQUISITE:</td><td>THEORETICAL: 24 HOUSRS
PRACTICAL: 24 HOURS</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce cattle production to students</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVE: On completion of this module, the students should be able to:

1.0: Know the importance of cattle rearing
2.0: Know the terminologies and equipment needed in cattle production
3.0: Know the various breeds of cattle in Nigeria.
4.0: Know the importance of housing in cattle production
5.0: Know the types and importance of identification in cattle production</td></tr>
</table>

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: CATTLE PRODUCTION 1				**CODE: CAH122**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION: THEORETICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	GENERAL OBJECTIVE 1.0: KNOW THE IMPORTANCE OF CATTLE REARING					
WEEK	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 State the importance of cattle rearing 1.2 Describe the economic importance of cattle rearing 1.3 Describe the socio-cultural importance of cattle rearing	Discuss the uses of cattle and their economic importance, e.g. meat & milk production, farm power. .				
	General Objective 2.0: Know the terminologies and equipment needed in cattle production					
	2.1 Explain the common terminologies and equipment in cattle production e.g., culling in-cow, bull, calf, calling, heifer, yearling; etc. 2.2 List the items and equipment required in keeping cattle. 2.3 Explain the uses of 2.2 e.g., shovel, head pan,	Describe the various terminologies to students. Explain the importance and uses of the various items		Identify the common terminologies in cattle production as in 2.1. Understand the various equipment	Carry out common termnologies identification in cattle production as in 2.1. Conduct a practical field visit to show and	Charts, Farm Visit, pictures.etc. shovel, head pan, wheelbarrow, feed and water

	wheelbarrow, feed and water troughs, fork, drum, rope, sprayer; etc.	and equipment applicable in cattle farming.		required in cattle keeping and their utilization	demonstrate the uses of the equipment used in keeping cattle	troughs, fork, drum, rope, sprayer; etc.
	General Objective 3.0: Know the various breeds of cattle in Nigeria.					
	3.1 Name the various breeds of cattle in Nigeria. 3.2 Describe the various breeds of cattle in Nigeria. 3.3 Differentiate between the various breeds of cattle in Nigeria.	List the various breeds of cattle in Nigeria. Discuss the various breeds in Nigeria and their features. Distinguish various breeds based on external features.	Pictures, Farm Visit;	Identify the different breeds of cattle in Nigeria	Guide students on identifying the different breeds of cattle in Nigeria	Farm visits and audio-visual teaching aids
	General Objective 4.0: Know the importance of housing in cattle production					
	4.1 Describe housing for cattle. 4.2 Describe various types of housing for cattle. 4.3 Describe the importance of housing for cattle.	Discuss 4.1 – 4.3.		Identify the various housing for cattle keeping.	Conduct a field visit to show students various types of housing for cattle.	Visit to cattle farm, pictures.
	General Objective 5.0: Know the types and importance of identification in cattle production.					
	5.1 State the importance of identification in cattle keeping.	Explain 5.1 – 5.3		Identify the different methods	Guide students to	Farm visit and Animal

	5.2 Name the different types of identification of cattle. e.g ear tagging,ear notch, neck collar, hot iron branding,tattoo, micro chip. 5.3 Differentiate between the various types of identification of cattle.			of identification of cattle in 5.2.	identify various methods of identification of cattle	Research Institute e.g., NAPRI

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="3">MODULE: INTRODUCTION TO FISHERIES TECHNOLOGY</td><td>COURSE CODE: CFT121</td><td>CONTACT HOURS: 48 Hours</td></tr>
<tr><td>YEAR: 1</td><td>TERM: 2</td><td>PRE: REQUISITE:</td><td colspan="2">Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="5">GOAL: This module is designed to introduce the students to the general overview of fisheries.</td></tr>
<tr><td colspan="5">GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0 Understand fisheries development in Nigeria and know external morphology of bony fish.
2.0 Understand basic fish biology
3.0 Understand the concept of fisheries technology and know internal morphology (anatomy) of bony fish.
4.0 Understand the basics on standards and trade development facility (STDF) concept.</td></tr>
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PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN FISHERIES PRODUCTION						
MODULE: INTRODUCTION TO FISHERIES TECHNOLOGY (THEORITICAL AND PRACTICAL CONTENT)				**COURSE CODE: CFT 121**		**CONTACT HOURS: 48 Hours**
YEAR: 1	**TERM:** 2	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours			
GOAL: This module is designed to introduce the students to the general overview of fisheries						
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: Understand Fisheries Development In Nigeria And Know External Morphology Of Bony Fish.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1 – 3	1.1 Outline the history of fisheries development in Nigeria. 1.2 Explain the importance of fish in human nutrition. 1.3 Explain the status of fisheries resources production in Nigeria economy. e.g. fisheries statistics, fisheries potentials etc. 1.4 Explain the roles of the following fisheries sub-sector in Nigeria	Explain the history of fisheries Development in Nigeria. Highlight the nutritional value of fish in human nutrition. Discuss 1.3 – 1.4.	Documentary on all aspects of fisheries sub-sector economy in Nigeria. Federal Department of Fisheries (FDF) publications on current statistics of fisheries production.	1.1 Identify external features used in classifying fish e.g. scales, barbles, fins etc. 1.2 Differentiate between fin fishes and shell fishes. 1.3 Identify the main groups of Nigerian Fishes (marine, brackish water and fresh water species) and their diagnostic features. 1.4 Describe main characteristics	Guide students on fish identification using external features e.g. scales, barbles, fins. etc Show samples of external features used in the classification of fish. Show samples of fin fishes and shell fishes as follows: - Shell fish e.g. prawn, oyster, etc	Fish museum Preserved specimens of the relevant fishes. Specimens/ chart of finfish and shellfish e.g. shrimp, oysters, crayfish etc.

	economy a) Artisan (subsistence, small-scale & commercial) b) Industrial c) Aquaculture 1.5 State the problems associated with each sub-sector in 1.4 and suggest possible solutions.	Explain the problems associated with each sub-sector in 1.4 and suggest possible solutions.		of each group of Nigerian fishes identified in 1.3.	- Finfish e.g. Tilapia, etc. -Guide students to differentiate between fin fish and shell fishes. -Show specimens of fishes from the three aquatic environment (marine, brackish and fresh water) highlighting their diagnostic features and main characteristics	Preserved specimen of "ancient" e.g. polypterid and "modern" fish e.g. Tilapia etc. Fresh specimen of relevant fishes.

GENERAL OBJECTIVE 2.0: UNDERSTAND BASIC FISH BIOLOGY						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
4 - 6	2.1Identify different types of fish e.g. (a) bony/cartilaginous fish (b) finfish/shell fish. 2.2 Group fishes into: - a) freshwater/saltwater fishes. b) Scale/Scale less fishes.	Give examples on the different types of fish such as: - (a) Bony fish – Tilapia spp, clarias spp. (b) Cartilaginous – shark, skate, rays. (c) Fin fish - Tilapia spp, Clarias spp, shark (d) Shell fish - crayfish, prawn, oysters. Explain the characteristics of the two groups of fish listed in 2.2.	Documentary on any aspect of fisheries in Nigeria. Map of Nigeria showing major water bodies Flip charts or chalk board. Preserved specimen of different types of fish e.g. Freshwater fishes – lates, Heterotis. Saltwater fish – ethmalosa			

	2.3 List external features of fish and their functions. e.g fins, scales, eyes, operculum. 2.4 List the internal features of fish and their functions. e.g liver, kidney, gills, gas bladder. 2.5 Outline the processes of growth of fish.	Describe the external and internal features of fish and their functions. Explain the processes of growth of fish.	(bonga fish), croaker. Scale fish – Tilapia spp, heterotis. Scaleless fish – clariids.			
GENERAL OBJECTIVE 3.0: Understand the Concept of Fisheries Technology and Know the Internal Features of Bony Fish						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
7- 10	3.1 Explain the following: - a) Fish technology - handling, processing, and preservation. b) Fishing technology – gear and craft c) Aquaculture technology - Culturing.	Discuss various aspects of fisheries technology listed in 3.1.	Flip charts of processing Activities using gear and craft Documentaries on fisheries technology listed in 3.1	3.1 Identify the alimentary canal and associated structures e.g. mouth, teeth, pharynx, esophagus, stomach, intestine, pancreas, liver, kidney and Spleen of fish. 3.2 Identify other	Undertake laboratory dissection of fish showing different parts of the alimentary canal from mouth to anus and other internal organs.	Dissecting kit, preserved and Fresh specimens of fish and ruler. Fresh and preserved fish specimen.

				internal organs of fish e.g. gas bladder, gills, gonads, heart and pituitary gland. 3.3 Dissect fish to see the alimentary canal. 3.4 Draw to scale fish alimentary canal relative to body length.	Demonstrate how to dissect fish Guide students to draw scale fish alimentary canal relative to body	
GENERAL OBJECTIVE 4.0: Understand the basics on standards and trade development facility (STDF) concept.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
	4.1 Describe standard and trade development facility (STDF) concept in fisheries value chain. 4.2 Discuss the importance of standard and trade development facility concept in fisheries value chain. 4.3 Outline the STDF concepts in fisheries.	Explain 4.1 – 4.3.	Internet.			

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: RABBIT PRODUCTION I		**COURSE CODE:CAH 133**	**CONTACT HOURS: 48**
YEAR: 1	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours	**TERM:** 3
GOAL: This module is designed to introduce the students to the general overview of rabbit production			

GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0: Know the importance of rabbit keeping.
2.0 Know the importance of Housing rabbits.
3.0 Understand the reproductive features of rabbits.
4.0 Know the common feeds for rabbits.
5.0 Understand the health of rabbits
6.0 Understand the terminologies for rabbit production

	General Objective 1.0: Know the importance of rabbits keeping.					
WEEK	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 State some reasons for keeping rabbits. 1.2 Explain the type of Rabbit breeds. 1.3 List the different types of rabbits.	Explain he economic role of rabbit production. Discuss the breeds of rabbit breed. Explain local breeds, Exotic breeds and crosses..		Identify the different rabbit breeds in your area.	Guide students on identifying and draw different rabbit breeds.	Farm visit
	General Objective 2.0: Know the importance of Housing rabbits.					
	2.1 Describe the housing of rabbits. 2.2 State the conditions necessary for siting rabbit housing. 2.3 Explain the importance of housing a rabbit.	Identify a place in the area suitable for rabbit feed availability, water etc. Describe 2.2		Identify and list local materials used for rabbit house construction.	Show students the available materials used for rabbit house construction	Farm visit

	2.4 List the materials used in constructing rabbit pen.	Discuss the reason for housing a rabbit e.g. avoid rain, sunshine, predators etc. State materials used in rabbit house construction				
	General Objective 3.0: Understand the reproductive features of rabbits.					
	3.1 Describe the reproductive organs of rabbit. 3.2 Explain the male reproductive organs of rabbit. 3.3 Explain the female reproductive organs of rabbit. 3.4 State the differences between the male and female organs.	Discuss 3.1 – 3.3. Differentiate the male and female organs in rabbits.		Identify and draw the male and female reproductive organs. Draw the male and female reproductive organs.	Guide students on the identification of male and female reproductive organs. Guide students to draw the male and female reproductive organs.	Live rabbits (male and female)

	General Objective 4.0: Know the common feeds for rabbits.					
	4.1 List the common feeds for rabbits.e.g ground nut haulms, ground cereals,spinach etc. 4.2 State the nutritional composition of the foods in 4.1 above. 4.3 Classify the foods in 4.1 into various classes. (protein, carbohydrates,vitamins etc)	Explain 4.1 – 4.3		Identify the common feed ingredients of rabbit. Classify the common feed ingredients of rabbit.	Carryout identification and classification of common feed ingredients of rabbit.	Visit to feedmill, farm visit, Sample of feed ingredients .
	General Objective 5.0: Understand the health of rabbits					
	5.1 Define disease and pest of rabbits. 5.2 Enumerate the diseases and pests common to rabbits. 5.3 Explain each of the conditions in 5.1 above. 5.4 Explain the importance of good sanitary condition and health in rabbits	Describe disease and pest of rabbits. Discuss 5.2 – 5.4.		Identify and list the common pests and diseases in rabbits. Identify diseased rabbits using common signs and	Carry out common pest and disease identification exercise. Guide students to identify diseased rabbits.	Visit to a veterinary clinic

				symptoms.		
	General Objective 6.0: Understand the terminologies for rabbit production.					
	6.1 List the common terminologies applicable in rabbit production. e.g. buck; doe, kitten, litter, meat, hutches, suckling, dam and sire. 6.2 Describe the common terminologies applicable in rabbit production. e.g. buck; doe, kitten, litter, meat, hutches, suckling, dam and sire.	Explain 6.1 – 6.2		Identify the common terminologies applicable in rabbit production. e.g. buck; doe, kitten, litter, meat, hutches, suckling, dam and sire.	Guide students on the identification.	

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: INTRODUCTION TO SWINE I		**COURSE CODE:CAH 134**	**CONTACT HOURS: 48**
YEAR: 1	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours	**TERM:** 1
GOAL: This module is designed to introduce the students to swine production			

GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0: Understand the Importance of Raising Pigs
2.0: Understand the systems of pig management
3.0: Know the Importance of Pig Housing in the Tropics
4.0: Understand feeding requirements for Pigs
5.0: Understand the routine management practices in pig production

PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: INTRODUCTION TO SWINE PRODUCTION I				CODE: CAH134	CONTACT HOURS: 48	
COURSE SPECIFICATION :THEORITICAL CONTENT 24 HOURS				PRACTICAL CONTENT: 24 HOURS		
	GENERAL OBJECTIVE 1.0: Understand the Importance of Raising Pigs.					
WEEK 1&2	SPECEFIC LEARNING OBJECTIVES	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECEFIC LEARNING OBJECTIVES	TEACHERS ACTIVITIES	LEARNING RESOURCES
	1.1 List the importance of raising pigs. 1.2 State the general characteristics of pigs 1.3 Outline the advantages and disadvantages of raising pigs. 1.4 Classifications and terminologies in pig production	-Discuss the reasons for raising pigs. -Locate areas in Nigeria where pigs are raised Explain the different classifications and terminologies in pig production		Understand the importance and characteristics of pigs	Demonstrate the importance and physical characteristics of pigs Show the biological classification of pigs	Pig farm
	General Objective 2.0: Understand the system of pig management.					
	2.1 Describe the following practices in swine production - - Free-range. - Semi-intensive. - Intensive. 2.2 Discuss the merits and demerits of each practice 2.3 Explain why and where each practice in 2.1 above may be preferred	Explain pig management systems Discuss the effective management practices in production to ease the disadvantages of the systems		Appreciate the practices and importance of different management systems in pigs	Assist students with merits and demerit of different management systems in pigs	Pig farm

	General Objective 3.0: Know the Importance of Pig Housing in the Tropics.					
4&5	3.1 State the importance of housing pigs. 3.2 List the raw materials used in pig pig house construction. 3.3 Describe the different types of pig houses. 3.4 List the basic facilities expected in a pig house.	○ Explain the advantages of good housing for pigs. ○ Explain conventional housing for pigs, e.g. backyard round huts, etc.		Identify the different facilities in a pig house.	Carry students and show them the various facilities in a pig house	Farm Visit
	General Objective 4.0: Understand feeding requirements for Pigs.					
	4.1 List the nutrients required by pigs e.g. carbohydrates, proteins, fat/oil, vitamins, minerals, water etc. 4.2 List the source of the nutrients in 4.1 above. 4.3 State the importance of the various nutrients in pigs.	Discuss the sources, nutrients requirements and importance of nutrients in pig production				Farm Visit

	General Objective 5.0: Understand the routine management practices in pig production.					
	5.1 Explain the importance of clean environment in piggery. E.g. clean beddings, feeders and water troughs. 5.2 Describe the use of dips and disinfectants in piggery. 5.3 Explain the importance of vaccination in pigs.	-Discuss the need for a clean environment in piggery. -Explain the various ways of maintaining a hygienic environment in the piggery.		Demonstrate the processes and procedures of routine management practices in piggery	Guide the students on processes and procedures of routine management practices in piggery	Farm Visit and Audio Visual

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: INTRODUCTION TO BASIC AQUACULTURE		**COURSE CODE: CFT 132**	**CONTACT HOURS: 48**
YEAR: 1	**TERM:** 3	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours
GOAL: This module is designed to acquaint students with the general principle of aquaculture particularly as it affects warm water fish species.			

GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0 Understand the meaning and scope of aquaculture.
2.0 Understand and know the various types of fish farming systems
3.0 Understand and know the importance of feed production in Aquaculture
4.0 Understand enemies of fish under culture.

MODULE: INTRODUCTION TO BASIC AQUACULTURE (THEORITICAL AND PRACTICAL CONTENT)			**COURSE CODE: CFT 132**			**CONTACT HOURS: 48**
YEAR: 1	**TERM:** 3	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24Hours			
GOAL: This module is designed to acquaint students with the general principle of aquaculture particularly as it affects warm water fish species.						
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: UNDERSTAND THE MEANING AND SCOPE OF AQUACULTURE.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1 – 2	1.1 Define aquaculture 1.2 Outline the history of aquaculture with particular reference to Nigeria, the present status and its prospects in future. 1.3 Explain the potential of aquaculture in boosting fish production in Nigeria. 1.4 Identify major culturable fish types in Nigeria e.g. table fish, ornamental fish, shellfish. 1.5 Differentiate between culturable and non-culturable fish species (i.e. fin fishes and shell fishes).	Explain the meaning of aquaculture, its development and the potential in boosting fish production with particular reference to Nigeria. Enumerate major culturable and non-culturable fish species and their characteristics. Discuss the differences in appearance, features and characteristics of culturable and	Charts, Pictures, Video clips Tables, whiteboard marker Fish museum Tilapia Clarias spp Hetero branchus Heterotis Mullet Chrysichthys Shrimps Macrobracium Paenus spp, Aquarium fishes e.g. Gold fish, Barbus spp. Etc	1.1 Identify key species of fish cultured in Nigeria 1.2 Identify major fish types in Nigeria e.g. table fish, ornamental fish, shellfish. 1.3 Identify the characteristics of culturable and nonculturable fish species (i.e. fin fishes and shell fishes).	Preserved or fresh culturable and non-culturable fish species. Guide students in identifying major fish types listed in 1.2. Guide students in identifying the characteristics of culturable and nonculturable fish species in 1.3.	Fish museum Preserved specimens of the relevant fishes. Specimens /chart of finfish and shellfish e.g. shrimp, oysters, crayfish etc. Preserved specimen of “ancient” e.g. polypterid and

		-culturabe fish species.		1.4 Separate fishes into culturable and non-culturable fish species. 1.5 Draw different culturable and non-culturable fish	Guide students to separate fishes into culturable and non-culturable species. Guide students to draw culturable and non-culturable fish species (fin fish and shellfish).	"modern" fish e.g. Tilapia etc. Fresh specimen of relevant fishes.
GENERAL OBJECTIVE 2.0: Understand the various types of fish farming systems.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
3 – 4	2.1 Define extensive, semi-intensive and intensive fish farming systems. 2.2 List the differences between extensive, semi intensive and intensive fish farming systems. 2.3 Explain the merits and demerits of the three culture systems mentioned in 2.2 above.	Explain the three classifications of fish farming systems listed in 2.1. Explain the differences of the three fish culture system above, as well as their merits and demerits.	White board, marker, pictures/ Diagram.	2.1 Identify the facilities for the culture of fish. 2.2 Prepare ponds for Stocking. 2.3 Stock pond according to stocking density.	Guide students on the identification of the various fish farm facilities	Reservoirs, pond, raceways, aquaria, tanks, cages, pens, recirculatory systems.

		Explain different facilities used in culturing fish.				
GENERAL OBJECTIVE 3.0: Understand the importance of feed production in aquaculture						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
5 – 6	3.1 Mention natural and supplementary feeds for fishes and their importance. 3.2 Differentiate between natural and supplementary feeds composition and methods of feeding. 3.3 List the methods available for the production of natural fish feed. 3.4 Explain locally available common fish feedstuffs and method of its formulation.	Discuss the importance of feed and feeding methods of natural and supplementary feeds to fishes knowing their differences. Explain the method available for the production of natural fish feed. Discuss locally available common fish feedstuffs and methods of their formulation	Marker, white board, pictures, charts etc.	3.1Carry out proper processing, formulation and compounding of simple fish ration. 3.2 Carry out practical feeding of fish.	Guide students to conduct practical on proper processing, formulation and compounding of simple fish ration. Demonstrate feeding of fish.	Grinding mill, weighing balance, mixer, scoop/cup, bowls, buckets, cooking pots, frying pans.

				3.3 Produce fish feed pellets. 3.7 Package fish feed pellets.	Demonstrate production of fish feed pellets. Demonstrate packaging of fish feed pellets	
GENERAL OBJECTIVE 4.0: Understand enemies of fish under culture.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
4.1	4.1 Explain water pollution and its sources. 4.2 Describe simple methods of improving water quality. 4.3 Explain fish predators and control. 4.4 Describe methods of controlling fish predators. 4.5Explain aquatic weeds associated with pond culture.	Discuss different sources of water pollution, and methods of improving water quality. Discuss fish predators and methods of controlling fish		4.1 Identify fish predators e.g. frogs/toads crocodiles, alligators, water tortoise, turtles, dragonfly larvae, birds etc. 4.2 Identify aquatic weeds. 4.3 Demonstrate methods of controlling fish	Guide students in identifying fish predators and aquatic weeds in existing ponds. Illustrate methods of controlling fish predators and aquatic weeds.	Paddles Canoe Secchi disc Alum Palm frond/grass/hay Water hyacinth (dried or fresh) Water lettuce, water lily, etc.

	4.6 Describe methods of controlling aquatic weeds. 4.7 List common fish diseases and parasites and how to control them	Predators. Discuss different aquatic weeds associated with pond culture and their control measures. Explain common fish diseases and parasites and their control measures.	Preserved/pictures of parasitized fish.	predators and aquatic weeds listed above. 4.4 Identify common fish diseases and parasites and how to control them.	Guide students to observe diseased fishes e.g. fungi infection, bloat, fin rot etc.	A chart of parasites and fish

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: INTRODUCTION TO BEEKEEPING PRACTICE</td><td>COURSE CODE: CBK131</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 1</td><td>TERM: 3</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to bee family (caste) members for production purposes</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0 Understand bee species and bee casts
2.0 Understand importance of beekeeping
3.0 understand beekeeping safety and security
4.0 understand beekeeping tools and equipment.</td></tr>
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PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: INTRODUCTION TO BEEKEEPING PRACTICE				**COURSE CODE: CBK 131**		**CONTACT HOURS: 48**
YEAR: 1	**TERM:** 3	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours			
GOAL: This module is designed to introduce the students to the Beekeeping practice						
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: Understand the bee species and bee casts						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1-2	1.1 Explain bee species within the colony. 1.2 Describe bee casts. 1queen bee. 2 worker bee 3Drone bee 1.3 Explain the biological life of bees 1.4 Explain the biological stages of bee development in the 3 casts	Describe bee species within the colonies Discuss bee casts. Discuss the biological life of bees Describe the biological	Chart, multimedia and projector, poster drawing and pictures	Identify different bee species within colony Identify the three cast of honey bee in hive colony Diagram of bee life cycle.	Show students the bee biology and how the bee behaves within the colony	Sketched and labelled Queen, worker and drone bee projector Text book

	1 .Larvae 2 Pupa 3Adult	stages of bee development in the 3 casts				
GENERAL OBJECTIVE 2.0: Understanding the importance of beekeeping						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
3-5	2.1 Explain the agricultural importance of beekeeping. 2.2 Explain the economic importance of beekeeping. 2.3 Explain the medicinal importance of beekeeping	Discuss the importance of beekeeping agriculturally, ecomically and medicinally.	Textbooks and the internet			
GENERAL OBJECTIVE 3.0: Understand bee keeping safety and security						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
6-9	3.1Explain safety precaution in beekeeping.	Discuss the safety precaution in beekeeping farming.	Bee suit, smoker, hand glove and boot	Demonstrate use of appropriate safety equipment in apiary.	Guide the student to wear the protective gear and how to use the equipment	Bee suit, smoker, hand glove. Boot.

	3.2. Explain security measures in beekeeping.	Discuss security measures in beekeeping.		Show the student the various ways of providing security in apiary e.g., fencing using cement block or wires if necessary	Guide the student how to fence the apiary against theft and fire outbreak	
GENERAL OBJECTIVE 4.0: Understanding beekeeping tools and equipment						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
10-12	4.1. List the beekeeping equipment and materials. 4.2. explain the use of bee hives 4.3. Explain the use of bee suit 4.4. explain the use of bee smoker	Discuss the beekeeping equipment and materials Discuss the use of bee hives Discuss the use of bee suit Discuss the use of bee smoker	Hives	Identify beekeeping equipment and materials. Identify the use of bee hives Identify the use of bee suit Identify the use of bee smoker	Demonstrate the use of beekeeping equipment and materials. Demonstrate the use of bee hives Demonstrate how to wear the bee suit to the students Demonstrate the use of bee suit	Bee hives, complete bee suits, smoker, hive tool.

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: POULTRY PRODUCTION II</td><td>COURSE CODE:CPP 211</td><td>CONTACT HOURS:48</td></tr>
<tr><td>YEAR: 2</td><td>TERM: 1</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to basic poultry production practices</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:
On completion of this module, the trainee should be able to:

1.0 understand the terminologies in poultry production
2.0: Know different classes of poultry
3.0: Understand the classes of feed ingredients available for poultry
4.0 Understand the various diseases and pests in poultry
5.0: Understand the climatic adaptions of poultry</td></tr>
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PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: POUTRY PRODUCTION II				**CODE: CPP 211**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION : THEORITICAL CONTENT 24 Hours				**PRACTICAL CONTENT: 24 Hours**		
	General Objective.1.0 understand the terminologies in poultry production					
WEEK	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Explain some of the terminologies in poultry raising, Tom, ducklings chicks, growers, layers, brooding hen, cockerels, chickens. 1.2 Explain the terms used in different types of feeds 1.3 Explain terms used in processing of poultry meat.	Describe the various terminologies with students Describe different types of feeds in poultry		Identify the various terminologies in poultry and different types of feed in poultry	Assist students to know the terminologies and different types of feed in poultry based on age and production purpose	Visit to poultry farm Visit to poultry farm
	General Objective 2.0: Know different classes of poultry.					
	2.1 Explain the different classes of poultry e.g. pullets for eggs production, broiler for table meat. 2.2 Outline the characteristics of indigenous birds; e.g.	Describe the features of local chicken, duck, turkeys, ostriches, pigeon, guinea fowls, etc.		Identify the different features of domestic poultry species Identify the	Assist students to know the external features and characteristics of different poultry species	poultry farm visit and Live birds audio visual aids of different species world wide

	small in size, multi plumage. 2.3 Outline the characteristics of exotic birds e.g. fast growing, big in size, white, brown or black Plumage .	Discuss 2.2 – 2.3		characteristics of indigenous birds; e.g. small in size, multi plumage. Identify the characteristics of exotic birds e.g. fast growing, big in size, white, brown or black Plumage.	Guide students to identify 2.2 – 2.3	
	General Objective 3.0: Understand the classes of feed ingredients available for poultry.					
	3.1 Explain the digestive system of a known poultry breed e.g. domestic fowl. 3.2 Explain the various sources of nutrients for poultry, e.g. carbohydrate (maize, sorghum) etc.	Draw and label the digestive system of poultry birds Discuss the various feed ingredients e.g. maize sorghum, Cassava etc.		identify the function of digestive system Show the students the various types of feed ingredients used in poultry	Highlight the features and function of the digestive system of poultry birds Guide the students the different type of feed	Desertion of killed poultry chicken Visit to feed mill

	3.3 Explain the various additives available for poultry feeds in e.g. vitamin, premix for ducks, growers, layers and broilers	Discuss the various additives available for poultry feeds in e.g. vitamin, premix for ducks, growers, layers and broilers		Identify the various additives available for poultry feeds in e.g. vitamin, premix for ducks, growers, layers and broilers	ingredients and their sources available in the market Guide students to Identify the various additives available for poultry feeds in e.g. vitamin, premix for ducks, growers, layers and broilers	
	General Objective: 4.0 Understand the various diseases and pests in poultry.					
	4.1 Describe the various diseases and pests of poultry.	Discuss various diseases and pests of poultry.		Identify common poultry diseases	Guide students to identify common disease of poultry	Sick poultry birds , drugs ,dewormer

	4.2 Describe the ectoparasites and endoparasites in poultry 4.3 Distinguish between ectoparasites and endoparasites.	Discuss types of endoparasites and their control measures.				
	General Objective 5.0: Understand the climatic adaptations of poultry					
	5.1 Explain the prevailing climatic conditions in your locality. 5.2 Explain the effects of climate on poultry raising. 5.3 Explain the effective, preventive and curative measures for poultry diseases.	Discuss the prevailing weather condition, its effects on growth and egg Production. Discuss the effects of climate on poultry raising. Describe the effective, preventive and curative measures for poultry diseases.		Identify the measures of controlling weather condition in poultry	Guide students on weather controlling measures and effects	Anti stress Drugs should introduced

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: SHEEP AND GOAT PRODUCTION II</td><td>COURSE CODE:CAH 211</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 2</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td><td>TERM: 1</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to the basic sheep and goat production practices</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:
On completion of this module, the trainee should be able to:

1.0: Know the common terminologies in sheep and goats production
2.0: Understand reproduction in sheep and goats
3.0: Understand the basis of breeding selection in sheep and goats
4.0: Understand the nutrition and feeding of sheep and goats.
5.0: Known the common diseases of goats and sheep
6.0: Know the slaughter and processing of sheep and goats</td></tr>
</table>

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: SHEEP AND GOATS PRODUCTION II				**CODE: CAH 211**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION: THEORETICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	GENERAL OBJECTIVE 1.0: Know the terminologies and attractive properties of sheep and goats.					
WEEK	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Discuss the general terminologies in Sheep and Goat production.- eg Parturition, flock, suckling. 1.2 For Goats: Billy, Nanny, kid, kidding, whether, flock chevon, servicing. 1.3 For Sheep ram, Ewe, Lamb, Mutton and Lambing.	Describe 1.1 – 1.3.	Textbooks.			
	General Objective 2.0: **Understand reproduction in sheep and goats**					
	2.1 State the age range of puberty in sheep and goats. 2.2 Explain how to care for a breeding Doe and Buck. 2.3 Explain how to care for a breeding Ram and Ewe. 2.4 Define puberty, estrus, ovulation, fertilization,	Discuss 2.1 – 2.4..		Identification of matured sheep and goats. Identification of pregnant sheep and goats.	Guide students to identify matured and pregnant sheep and goats.	Farm visit and animal research institute

	gestation, and parturition.					
	General Objective 3.0: Understand the basis of breeding selection in sheep and goats.					
	3.1 Discuss selection in sheep and goats 3.2 Describe types of selection in sheep and goats 3.3 Explain the characteristics to look for in the selection of sheep and goats.	Describe selection in sheep and goats Discuss types of selection in sheep and goats Describe the characteristics to look for in the selection of sheep and goats.		Carryout selection of sheep and goats. Identify the characteristics in selection of sheep and goats.	Demonstrate to students sheep and goats selection. Guide students on identifying suitable characteristics in selection of sheep and goats	Farm visits and animal research institute
	General Objective 4.0: Understand the nutrition and feeding of sheep and goats.					
	4.1 Describe the feeding practices of sheep and goats 4.2 List the essential classes of feed. 4.3 List different grasses and legumes used in feeding sheep and goats.	Discuss the feeding practices of sheep and goats Describe the essential classes of feed. Discuss the different grasses and legumes used in feeding sheep and goats.		Identify common grasses and legumes. Prepare album of grasses and legumes.	Guide students to Identify common grasses and legumes. Guide students to produce an album of grasses and legumes.	Farm visit and feeds mill

	General Objective 5.0: **Know the common diseases of sheep and goats.**					
	5.1 State the signs of diseases in sheep and goats. 5.2 Describe external parasites. 5.3 Discuss internal parasites. 5.4 Explain the importance of vaccinations of sheep and goats.	Discuss the signs of diseases in sheep and goats Discuss the external and internal parasites. Describe the importance of vaccinations of sheep and goats.		Identify external and internal parasites. Classify parasites into external and internal.	Carryout parasite identification and classification.	Farm visits, abattoir and animal research institutes e.g. NAPRI and NVRI
	General objective 6.0: **Know the slaughter and processing of sheep and goats**					
	6.1 Know the products of sheep and Goats. 6.2 Know the by-products of sheep and goats 6.3 Know the uses of the products in 6.1 and 6.2 above.	Discuss the sheep and goat products and by-products, such as meat, blood, bones and skin. Discuss the importance of sheep and goats products and by products.		Identify the by products of sheep and goats.	Carryout the identification of sheep and goats by products	Farm visits, abattoir visit and animal research institutes e.g. NAPRI and NVRI

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: CATTLE PRODUCTION II</td><td>COURSE CODE:
CAH 212</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 2</td><td>TERM: 1</td><td>PRE-REQUISITE:</td><td>THEORETICAL: 24 HOURS
PRACTICAL: 24 HOURS</td></tr>
<tr><td colspan="4">GOAL: The module is designed to acquaint trainees with terminologies in cattle production</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVE: On completion of this module, the trainee should be able to:

1.0: Understand the various breeds of cattle with their features
2.0: Know the breeds of hybrids and their features
3.0: Know the management systems in cattle production
4.0: Know the feeds and feeding of cattle
5.0: Understand hygiene and health care in cattle production
6.0: Understand the different features of the sexes
7.0: Understand the products and by-products of cattle</td></tr>
</table>

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE CATTLE PRODUCTION II				**CODE: 221**	**CONTACT HOURS:48**	
COURSE SPECIFICATION: THEORETICAL CONTENT 24				**PRACTICAL CONTENT:24**		
	GENERAL OBJECTIVE 1.0: Understand the various breeds of cattle with their features					
WEEK 1&2	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
	1.1 List the various breeds of cattle in Nigeria. 1.2 Explain various breed of cattle based on their features. 1.3 Differentiate between the various breeds	State various breeds of cattle in Nigeria. Describe the breeds and their peculiar features that give them special adaptation e.g., Muturu resistant to trypanosomiases', Gudali with pronounced development for heat stress.		Identify the various breeds of cattle.	Guide students to identify the various breeds of cattle.	Visit to modern farm and animal research institute (NAPRI Zaria & NVRI Vom, Jos
	General Objective 2.0: Know the breeds of hybrids and their features.					
	2.1 List the exotic breeds of cattle. 2.2 list dairy cattle from the list above. 2.3 list beef type of cattle from 2.1 above	Describe the various foreign breeds.		Identify the various hybrid cattle you know	Guide students to identify the different cattle hybrids available in Nigeria.	Visit to modern farm and animal research institute (NAPRI Zaria & NVRI Vom, Jos

	General Objective 3.0: Know the management systems in cattle production.					
	3.1 Explain the cattle management system in Nigeria. 3.2 Explain extensive Management system 3.3 Explain intensive management system. 3.4 Explain semi intensive system management system	Discuss the various management systems, highlighting their merits and demerits as they affect cattle production.		Identify the various cattle management systems.	Guide students on the Identification of the various cattle management systems.	Farm visits and other relevant institutions for a study tour
	General Objective 4.0: Know the feeds and feeding of cattle					
	4.1 List the common feeds for cattle. 4.2 Explain the feeding pattern of cattle. 4.3 State the	State the common feeds for cattle. Describe the feeding pattern of cattle. Describe the quality and		Identify the common feeds for cattle. Carry out the feeding pattern of cattle.	Assist students to identify the common feeds for cattle. Demonstrate the feeding patterns.	Visit to modern farm and animal research institute

	importance of these feeds to the cattle.	quantity of the feeds needed for use and their effects on growth, meat and milk production.				
	General Objective 5.0: Understand hygiene and health care in cattle production.					
	5.1 Explain the hygiene and health requirements for cattle. 5.2 Explain appropriate ways of manure disposal as it affects the general health of cattle. 5.3 Discuss causes of infection in cattle. 5.4 Describe ways of disease and pest prevention	Discuss the hygiene and health requirements for cattle. Describe appropriate ways of manure disposal as it affects the general health of cattle. Explain causes of infection in cattle. Discuss ways of disease and pest prevention		Carryout routine management for cattle. Identify the causes of infection from pests and diseases.	Guide student to carryout routine management for cattle. Assist student to identify the causes of infection from pests and diseases.	Farm visit
	General Objective 6.0: Understand the different features of the sexes					
	6.1 Define reproduction.	Explain the reproduction pattern in cattle. Discuss the reproductive		Know the reproductive patterns in cattle with illustration of	Assist students with illustrations of the reproductive	Visit to animal research institute

	6.2 Describe the reproductive process in cattle. 6.3 Describe gestation	process in cattle. Discuss gestation		the male and female organs Draw the reproductive organs of male and female cattle.	patterns in cattle. Guide students to draw the reproductive organs of male and female cattle.	
	General Objective 7.0: Understand the products and by-products of cattle					
	7.1 List the products from cattle rearing 7.2 List the by-products from cattle rearing. 7.3 Explain the uses of the various products and by-products from cattle keeping.	Describe the importance of milk, and beef—the use of hides.		Identify the different products and by-products from cattle keeping	Guide students on identifying the different products and by-products from cattle keeping	Visit modern farms, animal products processing factories (Sabore, L&Z, etc.), and animal research institutes

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: RABBIT PRODUCTION II		**COURSE CODE:CAH 223**	**CONTACT HOURS: 48**
YEAR: 2	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours	**TERM:** 2
GOAL: This module is designed to introduce the students to rabbit production			

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1.0: understand of characteristics, types and problems of rabbits
2.0: know the materials in use for rabbits housing
3.0:understand breeding techniques in rabbits
4.0: understand breeding techniques in rabbit
5.0: understand the common diseases and pest of rabbits

PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: RABBIT PRODUCTION II				**CODE: CAH223**	**CONTACT HOURS:48**	
COURSE SPECIFICATION : THEORITICAL CONTENT 24 Hours				**PRACTICAL CONTENT: 24 Hours**		
	GENERAL OBJECTIVE 1.0: understand of characteristic, type and problems of rabbits					
WEEK	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Explain the general characteristics of different breeds of rabbits 1.2 Describe the various breeds of rabbits 1.3 Explain some common difficulties in keeping rabbits	Identify and list the coat colour, weight and length of the various breeds in your area. Discuss the various breeds of rabbits. Discuss the problems of rabbit keeping		Identify the different features of rabbit breeds Identify the various breed, of rabbits	Assist students to identify 1.1 – 1.2	Rabbit farm visit
	General Objective 2.0: know the materials in use for rabbits housing					
	2.1 Outline the important features of rabbits housing. 2.2 Explain the important features of rabbit housing 2.3 Explain materials in use for constructing rabbit housing	Describe 2.1 – 2.3.		Demonstrate proper direction of rabbitry with regards to wind and sun.	Show the students proper direction of rabbitry with regards to wind and sun.	Rabbit farm visit

	General Objective 3.0: Understand breeding techniques in rabbits					
	3.1 Describe maturity in rabbits. 3.2. Explain the importance of breeding. 3.3 Explain the mating pattern and ratio in buck and does. 3.4 State the signs of pregnancy in rabbits. 3.5 State signs of parturition or kindling in rabbits.	Describe the age of sexual maturity in buck and doe. Discuss the importance of breeding. Describe mating pattern and ratio in buck and does. Explain the signs of pregnancy in rabbit. Explain the signs of parturition or kindling in rabbit.		Identify sexual maturity in buck and doe. Carryout mating of buck and doe in the pen.	Guide students to identify sexual maturity in buck and doe. Demonstrate mating of buck and doe in the pen.	Visit to rabbit farm
	General Objective 4.0: understand feeds and feeding in Rabbits					
	4.1 State the class to which rabbit belong (Pseudo ruminant). 4.2 Explain the types of feeds required by rabbits. 4.3 Explain the different classes of rabbit feeds.	Describe 4.1 – 4.3.		Identify nutritional diseases in rabbits	Guide students to identify nutritional diseases in rabbits	Rabbit farm visit and veterinary visit

	General Objective 5.0: understand the common diseases and pests of rabbits					
	5.1 Explain common Diseases of rabbits. 5.2 Explain the symptoms of diseases in rabbits. 5.3 State the control measures and prevention of mortality in young rabbits	Discuss 5.1 – 5.3.		Demonstrate the procedure involved in sanitation, vaccination and medication.	Assist students to carry out sanitation ,vaccination and medication of rabbits	Vaccines, syringe & needles, brooms and disinfectant

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: INTRODUCTION TO SWINE II		**COURSE CODE:CAH 224**	**CONTACT HOURS: 48**
YEAR: 2	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours	**TERM:** 2
GOAL: This module is designed to introduce the students to basic swine production practices			

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1.0: Understand the Terminologies and Importance of Raising Pigs
2.0: Understand the different breeds of pigs available
3.0 Know the types of breeding systems in pigs
4.0: Understand feeding requirements for Pigs

PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: INTRODUCTION TO SWINE PRODUCTION II				**CODE: CAH 223**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION :THEORITICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HORS**		
	GENERAL OBJECTIVES 1.0: Understand the terminologies and importance of raising pigs					
WEEK	SPECEFIC LEARNING OBJECTIVES	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECEFIC LEARNING OBJECTIVES	TEACHERS ACTIVITIES	LEARNING RESOURCES
1&2	1.1 Explain the following terminologies in pig rearing:-- boar, sow, farrow, pig let, gilts, barrows, in sow, dry sow, weaners, fattener, bacon, lard, pork. 1.2 Explain the different stages of pig production. 1.3 Economic importance of swine production	Discuss the terminologies in pig rearing. Discuss the different stages of pig production Explain economic importance of swine production		Identify the general terminologies in pig production	Assist students to know the terminologies in pig production	Farm visit.
	2.0: **Understand the different breeds of pigs available**					
	2.1 List the different breeds of pigs in the tropics. 2.2 Describe the	State the different breeds of pigs in the tropics.		Identify the different breeds and breeding	Assist student to know the different breeds and breeding system	Pig farm visit

	characteristics of the different breeds of pigs in the tropics. 2.3 Describe the characteristics of the different breeds of pigs in the temperate region.	Describe the characteristics of the different breeds of pigs in the tropics. Describe the characteristics of the different breeds of pigs in the temperate region.		system	in pig	
	3.0 **Know the types of breeding systems in pigs**					
4&5	3.1 Define breeding. 3.2 List different types of mating systems. 3.3 State the merits and demerits of each breeding system. 3.4 Define estrus, estrus cycle and signs of estrus in sow, time of estrous, length and time of evaluation in pigs. 3.5 Define fertilization, gestation and parturition in pigs.	Discuss 3.1 – 3.5		Identify the different breeding types	Assist students to know breeding and mating system	Farm Visit

	General Objective 4.0: Understand feeding requirements for Pigs					
	4.1 Describe the digestive system of pigs as a monogastric animal. 4.2 List the classes of feedse.g. Concentrates, protein, vitamins, minerals etc. 4.3 Describe the digestion of food in the mouth, Stomach, small and large intestine and absorption of foods.	Discuss 4.1 4.3.		Identify the various sources, nutrients and requirements in pig production.	Assist students to identify the various sources, nutrients and requirements in pig production.	Farm Visit

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: FISHING GEAR AND CRAFT TECHNOLOGY (THEORETICAL AND PRACTICAL)</td><td>COURSE CODE: CFT 221</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 2</td><td>TERM: 2</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to teach students the basic principles of designing, constructing, and using common fishing gear and crafts in Nigeria.</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0 Understand the various classifications of fishing gears.
2.0 Know netting materials for gear construction.
3.0 Know the basic processes of net construction.
4.0 Know different types of fishing craft/boats</td></tr>
</table>

MODULE: FISHING GEAR AND CRAFT TECHNOLOGY (THEORITICAL AND ONLY)			**COURSE CODE: CFT 221**			**CONTACT HOURS: 48**
YEAR: 2	**TERM:** 2	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours			
GOAL: This module is designed to teach the students the basic principles of designing, constructing and using common fishing gear and crafts in Nigeria						
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: Understand the Various Classifications of Fishing Gears.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1 – 2	1.1 Describe the traditional and modern fishing gear used in Nigeria. 1.2 Describe fishing gear and methods based on modes of netting under: -Active fishing gear (trawl, cast net, seine nets, claps nets, etc) -Passive fishing gear (gill net, trammel nets, traps etc.) 1.3 Maintenance of fishing nets	Explain fishing gear as mentioned in 1.1 and 1.2 Explain necessary procedures in maintaining fishing nets.	Collection of active and passive Gears (models), diagrams, textbooks, pictures, etc.	1.1 Identify the traditional and modern fishing gear used in Nigeria. 1.2 Classify fishing gear and methods under: -Active fishing gear (trawl, cast net, seine nets, claps nets, etc) -Passive fishing gear (gill net, trammel nets, traps etc.)	Conduct physical Identification and sketches of the relevant fishing gear mentioned in 1.1 and 1.2. guide students on how to properly maintain fishing nets to last longer.	Collection of active and passive gears (models)

GENERAL OBJECTIVE 2.0: Know Netting Materials for Gear Construction.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
3 – 5	2.1 Describe natural fiber materials for net construction. 2.2 Describe physical characteristics of synthetic fibers (flexibility, strength, etc).	Explain 2.1 – 2.2		2.1 Identify natural fiber materials for net construction. 2.2 Identify synthetic fiber materials for the net construction. 2.3 Carry out identification tests on the various types of synthetic fibers (water and visual test) on various types of synthetic fiber.	Guide students to make physical identification and reports on the natural and synthetic fibers materials used for net construction. Guide students to carry out identification tests.	Collections of samples of : Cotton Sisal Ramie (Root fibers) Synthetic Fibers (PA, PE, PP) Net Loft

GENERAL OBJECTIVE 3.0: Know the Basic Processes of Net Construction.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
6 - 9	3.1 Define terms associated with net construction viz. normal and T –cut, bar cut, combination cut etc. 3.2 Describe hanging ratio (coefficient) and its effects on shape of net and application constraints.	Explain the meaning of the terms listed in 3.1. Explain hanging ratio and its effects on shape of net and application constraints.	White board, marker, pictures/ diagrams.	3.1 Carry out all the processes involved in net construction, namely, braiding, strand formation (rope), tapering, creasing, joining, knotting etc. 3.3 Mount netting material on support ropes (head and foot) 3.4 Mount net using 50% and 60% hanging.	Demonstrate the processes in net construction listed in 3.1. Guide students to mount netting materials on support ropes (head and foot) and also to mount net using 50% and 60% hanging.	Net loft Gear models Cutting Blades Mending needles Netting material Kuralon rope Markers

GENERAL OBJECTIVE 4.0 Know Different Types of Fishing Craft (Boat).						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
10 - 12	4.1 Describe a typical fishing craft and boat. 4.2 Classify crafts into calabash; bamboo rafts (aids) canoes, dingy, boats, and trawlers etc. 4.3 Differentiate between mechanized and non-mechanized boats.	Explain 4.1 to 4.2 Illustrate the differences between mechanized and non-mechanized boats.		4.1 Identify different types of fishing boat e.g. wooden, glass fiber, steel, ferrocement etc. 4.2 Identify simple tools for building boats. 4.3 Identify boat parts. 4.4 Design simple fishing boat (model). 4.5 Draw a simple fishing boat plan.	Show students various aids/models/sketches of relevant fishing craft/boat. Guide students to identify crafts as listed in 4.1 and types of fishing boats as listed. Show simple tools used for building boats and different boat parts. Guide students on designing and drawing of simple boat.	Metal/wood workshop. Craft models (calabash, bamboo rafts, canoes, dingy etc) Life size model boats (dingy, trawler, outboard engine on wooden, ferrocement or glass fiber boat). Complete Tools box.

<table>
<tr><td colspan="3">MODULE: INTRODUCTION TO FISH FARM ENGINEERING (THEORETICAL AND PRACTICAL)</td><td>COURSE CODE: CFT 232</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 2</td><td>TERM: 3</td><td>PRE: REQUISITE:</td><td colspan="2">Theoretical: 48 Hours
Practical: 48 Hours</td></tr>
<tr><td colspan="5">GOAL: This module is designed to enable students understand the basic design and construction of simple fish culture facilities and how to maintain them.</td></tr>
<tr><td colspan="5">GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0 Understand the criteria to apply in selection of site for fish farms.
2.0 Know the design of simple fish farm structures.
3.0 Know the use and construction of fish farm facilities.
4.0 Know the concept of Hatchery design.</td></tr>
</table>

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: : INTRODUCTION TO FISH FARM ENGINEERING				**COURSE CODE: CFT 232**		**CONTACT HOURS: 48**
YEAR: 2	**TERM:** 3	**PRE: REQUISITE:**		**Theoretical:** 24 Hours **Practical:** 24 Hours		
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: Understand the criteria to apply in selection of site for fish farms						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1 - 3	1.1 Describe fish farm engineering.	Explain fish farm engineering.		1.1 Carry out reconnaissance survey of farm site for vegetation, water source, water quality, topography, etc. 1.2 Determine elevation and distance using simple instruments like, hand level, kern levels, ranging poles, measuring tapes etc. 1.3 Perform simple suitability tests e.g. permeability test, soil	Guide students to carry out reconnaissance survey of farm site for the factors listed in 1.1. Use hand level, kern level, ranging pole, measuring tape to determine elevation and distance. Conduct practical with students on soil suitability tests listed in 1.3.	Staff rod, kern level, measuring tape, ranging pole, tripod stand. Digger, shovel, soil-auger, Cutlass, soil analysis kit. Drawing table and instruments. Laboratory. Soil samples

				structure/plasticity test. 1.4 Perform simple water quality test e.g. temperature, turbidity, dissolved oxygen, PH, alkalinity, ammonia, etc.	Demonstrate how to determine water quality test listed in 1.4 using water quality kit or titration method in the laboratory.	Water testing kits e.g. - Lovibond comparator - PH meter etc. Water sampler Laboratory.
GENERAL OBJECTIVE 2.0: Know the design of simple fish farm structures.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
4 – 6	2.1 Describe the design of fish farms structures such as (a). Earthen pond e.g. barrage, contour, etc. (b). Other holding facilities e.g. aquarium tank, concrete tank, homestead pond, raceway, plastic tank, wood/ plank tank, fiber glass tank.	Explain 2.1		2.1 Identify the common structures found in fish farm e.g. pond, sluice gate, wooden tank, fiber glass tank, concrete tank etc. 2.2 classify fish farm structures based on design	Take students out to see some common fish farm structures listed in 2.1. Supervise students' trips to fish farms and their reports on the design of fish farm structures mentioned in 2.2 Demonstrate practical design of varied	Ponds Concrete tank Shovel Digger Measuring tapes Head pan Wheel barrow Spade Borehole/ Reservoir (Dam) Builder's level (Plum)

					fish farm structure listed in 2.1 and 2.2.	
				2.3 Sketch Pond, dyke, core trench.	Show drawings and designs of pond, dyke, core trench.	
GENERAL OBJECTIVE 3.0: Know the use and construction of fish farm facilities.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
7 – 10	3.1 Describe the procedure for the construction of a typical earthen pond. 3.2 Describe the procedure for the construction of homestead/concrete pond. 3.3 Describe the procedure for the construction of transportation tank.	Explain 3.1 – 3.3.		3.1 Identify the following inlet and outlet devices: dyke (dam), monk, dyke protection devices, sluice gate, spillway, etc. 3.2 Determine surface area of pond for stocking based on size and species of fishes.	Show students the parts in 3.1 and assist them in making identification of the parts. Guide students to determine surface area of ponds for use in stocking them based on size and species of fish. Assign students in groups to construct	Fishpond. Bahamas grass, stone, cement etc. Glass sheet net, plant shooter etc Sealant, Resin catalyst. Accelerator, plastic basin Diamond cutter. Hollow block, cement, sand gravel, digger, shovel, etc.

				3.3Construct/assemble model earthen pond, aquarium tank, hapa/cage, and pen. 3.4 Set up other small fish farm holding structures e.g. fiberglass tank, plastic bowl, wood/plank tank etc. 3.5 Cut glasses using diamond cutter. 3.6 Take part in the construction of a standard Fish pond both Earthen and concrete.	various models in 3.3. Assign students in groups to set up other small fish farm holding devices listed in 3.4. Demonstrate how to cut glasses using Diamond cutter. Assist students in constructing a standard fishpond earthern or concrete.	

GENERAL OBJECTIVE 4.0: Know the concept of Hatchery design						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
11 - 12	4.1 Mention various types of hatcheries e.g. in-door, outdoor. 4.2 Mention other supporting structures e.g. Nursery Pond, Spawning tank etc.	Describe various types of hatcheries and other supporting structures listed in 4.1 and 4.2.		4.1 Identify incubator, spawning tank, brood stock tank etc. 4.2 Identify various types of hatcheries and hatchery structures listed in 4.1 and 4.2 in an existing hatchery while on a visit.	Show students an incubator, spawning tank, brood stock tank in an existing fish farm. Visit existing hatchery with students and guide them to identify the various structures. Construct hatchery models with students.	Spawning tank, incubator, Glass sheet, cement, fiberglass, tanks, silicone/sealant, spawning mats etc.

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: INTRODUCTION TO BEEKEEPING METHODS, HIVES AND APIARY MANGEMENT</td><td>COURSE CODE: CBK 231</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 2</td><td>TERM: 3</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to understand various beekeeping methods and management practices.</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0 Understand beekeeping methods and hives management.
2.0 Understand apiary management
3.0 Understand bee transfusion, transportation and pollination
4.0 Understand the basics on standards and trade development facility concept.</td></tr>
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PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK						
MODULE: INTRODUCTION BEEKEEPING METHODS HIVES AND APOARY MANAGEMENT				**COURSE CODE: CBK 231**		**CONTACT HOURS: 48**
YEAR: 2	**TERM:** 3	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours			
GOAL: This module is designed to introduce the students to understand beekeeping methods and management practices.						
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: Understand beekeeping methods and hives management						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1-4	1.1. Explain beekeeping methods. 1.2 list beekeeping method 1.3 Describe the advantages and disadvantages of each beekeeping method	Discuss the bee keeping methods. Explain beekeeping method. Explain the advantages and disadvantages of each method.	Chart of various types of hives	Demonstrate the beekeeping methods Identify different bee hives and their management methods. Demonstrate how to use each method	Carry out measurements of bee hive Guide the student on use of each method	Hammer, tape rule, nail and saw Hive

GENERAL OBJECTIVE 2.0: Understand Apiary management (hive inspection colony management)						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
5-9	2.1 Define apiary 2.2 Describe a good apiary site 2.3 Explain how to attract bees into a hive 2.4 Describe hive inspection. 2.5 Explain the importance of hive inspection 2.6 Outline procedures of apiary management.	Explain an apiary Explain a good apiary site Apiary management in beekeeping Explain hive inspection Discuss the importance of hive inspection Describe the procedures of apiary management. Discuss the methods of	Chart, pictures Chart, apiary	Demonstrate hive installation (hanging/ on stand). Select. Suitable apiary site. That conforms to requirement of accessibility, good vegetation, water supply and wind. Demonstrate to student how to inspect the hive in Apiary	Guide students on how to install hives in apiary. Guide students on how to establish apiary in a good vegetation area. Guide student on necessary steps how to inspecting hives in apiary.	Hive models (colonized and un colonized), lemon grass and bee wax

	2.7 List two methods of installing hive in the apiary e.g., Hive hanging on tree and place hive on iron stand. 2.8 Explain colony division on existing hive to new hive	installing bee hive in the apiary. Discuss colony division on existing hive to new hive		Show student how to use bait material to bait the new hive Carryout colony division on existing hive	Guide the student on how to apply the bait materials on new hives Guide the student how to carryout the colony division	
GENERAL OBJECTIVE 3.0: Understand bee transfusion, transportation and pollination						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
10-12	3.1 Define bee transfusion. 3.2 Explain the importance of bee transfusion. 3.3 Explain the appropriate season and time for the bee transfusions.	Explain the bee transfusion. Discuss the importance of bee transfusion. Discuss the appropriate season and time for bee transfusions.	Documentaries. Video clips. Pictures and manual guide.	Demonstrate the processes of bee transfusion. Demonstrate to the student appropriate season and time for bee transfusions. Demonstrate the	Guide students on how to carryout bee transfusion Guide students to understand the appropriate seasons and time for bee transfusions	Colonized hive in apiary, audio visuals.

	3.4 Describe methods of bee transfusion 3.5 Describe the precautionary measures in bee transfusion. 3.6 Describe the colonies that require bee transfusion. 3.7 Define bee pollination 3.8 Understand the importance of pollination	Explain the method of bee transfusion Explain the precautionary measures in bee transfusion. Explain the colonies that require bee transfusion. Explain bee pollination Discuss the importance pollination Discuss bee transportation in beekeeping practice	pictures	different methods of bee transfusion Identify precautionary measure in bee transfusion Identify the colonies that require bee transfusion Demonstrate colony transportation	Guide student on the methods of bee transfusion Guide students to identify the precautions to be observed in bee transfusion Guide students to identify the colonies that require bee transfusion Carryout colony transportation	Complete protective gears, bellow smoker and hive tools.

	3.9 Explain bee transportation 3.10 Outline the method of colony hive transportation 3.11 List the necessary precaution for colony transportation	Describe the methods suitable for each hive Explain each precaution for colony transportation		Identify each precaution step for colony transportation	Demonstrate the step for colony transportation	
GENERAL OBJECTIVE 4.0: Understand the basics on standards and trade development facility (STDF) concept.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
	4.1 Describe standard and trade development facility (STDF) concept on beekeeping value chain. 4.2 Discuss the importance of standard and trade development facility concept on beekeeping value chain. 4.3 Outline the STDF concepts in beekeeping.	Explain 4.1 – 4.3.	Internet.			

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: POULRY PRODUCTION III</td><td>COURSE CODE:CPP 311</td><td>CONTACT HOURS:48</td></tr>
<tr><td>YEAR: 3</td><td>TERM: 1</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to basic poultry production practices</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:
On completion of this module, the trainee should be able to:

1.0 Understand the origin of the poultry species
2.0: Understand the importance and factors for choice of a site
3.0: Know the different types of equipment used in poultry keeping
4.0 4.0 Know the types of poultry feeds
5.0: Understand hygienic and health management practices
6.0: Understand the practice of hatching and brooding</td></tr>
</table>

PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: POUTRY PRODUCTION III				**CODE:CPP311**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION : THEORITICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	General Objective.1.0 Understand the origin of the poultry species					
WEEK 1&2	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
	1.1 Discuss the origin of poultry. 1.2 Differentiate between local and exotic breeds of poultry. 1.3 Describe Broilers for meat production. 1.4 Describe layers for egg production 1.5	Describe the origin of poultry. Distinguish between local and exotic breeds of poultry. Discuss Broilers for meat production. Discuss layers for egg production		Identification of different breeds of poultry Classify poultry into various breeds.	Guide students to identify different breeds of poultry Guide students to classify different breeds of poultry	Audio visual aids of different breeds Visit to poultry farm

	General Objective 2.0: Understand the importance and factors for choice of a site					
	2.1 Explain the importance of housing in poultry. 2.2 State the factors that may influence the choice of Housing' 2.3 Discuss the modern housing of production. 2.4 Discuss the traditional method of housing production	Describe the importance of good housing as it affects poultry performance. Describe 2.2 – 2.4.		Identify the importance of proper housing structure as it improves the performance of birds	Assist students on good site identification and construction of poultry house	Building Materials, chart
	General Objective 3.0: Know the different types of equipment used in poultry keeping					
	3.1 List various poultry equipment 3.2 Explain the use of each of these equipment 3.3 Explain the maintenance of these equipment	Describe 3.1 – 3.3.		Identify the various equipment and designs meant for each stage of growth Demonstrate the various	Assist students to identify the various equipment and designs meant for each stage of growth Show students the use of various	Poultry farm visit

				equipment and design use in poultry	equipment use in poultry.	
	General Objective: 4.0 Know the types of poultry feeds					
	4.1 List the various types of feeds in poultry production. 4.2 Explain pullet requirements at various stages of growth. 4.3 Explain Broiler requirements at various stages of growth	Discuss 4.1 – 4.3.		Classify feeds based on production purposes Identify different types of poultry feeds based on age and nutritional requirement of a birds	Guide students to classify feeds based on production purposes Guide students to identify some commercial feeds in the market. Show students different types of poultry feeds in relation to age, type and nutrients requirements of the bird	Visit to Feeds markets outlets
	General Objective 5.0: Understand hygienic and health management practices					
	5.1 Discuss general hygienic measures for poultry production.	5.4 Describe the general hygienic measures for poultry production.		Identify the symptoms and predisposing	Guide students to identify the	Visit to

	5.2 Discuss the management of drinkers, feeders and litter. 5.3 Explain possible diseases resulting from poor sanitation	Describe the management of drinkers, feeders and litter. Discuss the possible diseases resulting from poor sanitation		factors associated with pest and diseases in poultry	symptoms and predisposing factors associated with pest and diseases in poultry	veterinary facility
General Objective 6.0 Understand the practice of hatching and brooding						
	6.1 Explain the different types of -hatching - natural - artificial - 6.2 Define brooding 6.3 Explain types of brooding 6.3.1 hen 6.3.2 artificial 6.4 Differentiate the different types of hatching.	Describe hatching procedures and brooding exercise Discuss preparation for the arrival of chicks. Describe the various types of hatching.		Identify the basic brooding technique and rearing of chickens carryout brooding and rearing of chicks	Guide students to Identify the basic brooding technique and rearing of chickens Show the students brooding and rearing of chicks.	Visit to hatchery and access to brooding house and rearing of chickens

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: SHEEP AND GOAT PRODUCTION III</td><td>COURSE CODE: CAH311</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 3</td><td>TERM: 1</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to basic sheep and goat production practices</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:
On completion of this module, the trainee should be able to:

1.0: Know the reproduction organs of sheep and goats
2.0: Understand the care and management of kids and lambs
3.0: Understand pasture management and utilization by sheep and goats
4.0: Understand the selection of housing sites and the effects of climate on sheep and goats
5.0: Know the disease and pests of sheep and goats
6.0: Understand the breeding systems</td></tr>
</table>

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: SHEEP AND GOATS PRODUCTION III				**CODE: CAH 311**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION: THEORETICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	GENERAL OBJECTIVE 1.0: Know the reproduction organs of sheep and goats					
WEEK	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Describe the male reproductive system of sheep and goats 1.2 Describe the female reproductive system of sheep and goats 1.3 List of signs of estrous in sheep and goats	Discuss 1.1 – 1.3		Identify the male and female reproductive system Draw the male and female reproductive organs.	Guide students to identify male and female reproductive system Assist students to draw the male and female reproductive organs.	Drawing board, visit to animal research institute Sheep and goats farm
	General Objective 2.0: Understand the care and management of kids and lambs					
	2.1 Describe the processes of weaning kids and lambs. 2.2 Describe how to care for breeding and lactation.			Identify the feed ingredients used for weaning kid and lambs Identify feed requirements for lactating and breeding sheep and goats .	Guide students to identify ingredients used for weaning kid and lambs. Assist to identify feed requirements for lactating and breeding sheep and goats.	

	General Objective 3.0: Understand pasture management and utilization by sheep and goats					
	3.1 State importance of pasture to sheep and goat 3.2 List the types of pasture materials e.g. legumes (centrosome) grass, Andropogon gayanus 3.3 List the type of grazing management applicable in Nigeria 3.4 Define hay and silage 3.5 State the differences between them	Describe 3.1 – 3.5		Identify the types of pasture for sheep and goats. Prepare pasture album	Guide students to identify the types of pasture for sheep and goats. Assist students to prepare pasture album.	Farm visit and study tour to other relevant institutions
	General Objective 4.0: Understand the selection of housing sites and the effects of climate on sheep and goats					
	4.1 Describe the common sheep and goats housing 4.2 State the dimensions of the pen/padlock for sheep and goats 4.3 State the effect of	Discuss 4.1 – 4.4.		Identify common housing of sheep and goats Draw a typical sheep and goats house	Guide students on identifying sheep and goat house. Assist students to draw a typical sheep and goats house.	Visit farms Wood, Zinc, Grass. Mud, etc. observation of animals and pasture farm.,

	climate on the type of housing 4.4 List the effect of climate on the nutrition of sheep and goats					drawings, multimedia.
	General Objective 5.0: Know the diseases and pests of sheep and goats					
	5.1 Explain the disease of sheep and goat. 5.2 Explain the pests of sheep and goats 5.3 Explain nutritional disorder	Discuss 1.1 & 1.2 Discuss nutritional disorder diseases, e.g. hypo calcanei, Anaemia, etc.		Identify diseases and pests of sheep and goats. Carryout examination of diseased sheep and goats.	Assist students identify diseases and pest of sheep and goats. Demonstrate examination on sheep and goats.	
	General Objective 6.0: Understand the breeding systems					
	6.1 Discuss the breeding system in sheep and goats. 6.2 List the problems of infertility in sheep and goats. 6.3 Explain the productive hormones	Describe 6.1 – 6.3.		Identify the sheep and goat crosses and pure breeds in your locality Identify the different breeding systems for sheep and goats,	Assist student to identify breeds of sheep and goats. Guide students to identify various breeding systems for sheep and goats.	Farm visit and study tour to other relevant institutions

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="3">MODULE: CATTLE PRODUCTION III</td><td>COURSE CODE:
CAH 312</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 3</td><td>TERM: 1</td><td colspan="2">PRE-REQUISITE:</td><td>THEORETICAL: 24 HOURS
PRACTICAL: 24 HOURS</td></tr>
<tr><td colspan="5">GOAL: Trainee would be able to select quality animals like either beef (bulls) and milk (heifers)</td></tr>
<tr><td colspan="5">GENERAL OBJECTIVE: On completion of this module, the trainee should be able to:

1.0: Know the best breed for a production purpose
2.0: Understand health care and quarantine purposes
3.0: Understand the various management systems needed at various ages.
4.0: Know the reproductive activities in cattle production
5.0: Understand record-keeping
6.0: Understand milking procedures in cattle production
7.0: Know how to select replacement stock</td></tr>
</table>

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE CATTLE PRODUCTION III				**CODE: CAH 312**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION: THEORETICAL CONTENT 24 HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	GENERAL OBJECTIVE 1.0: Know the best breed for a production purpose					
WEEK	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Describe the characteristics of the breeds and the reasons for their preference			1 Identify the breed best suited for your locality.	Illustrate the characteristics of various breads and explain why people prefer them.	Farm visit
	General Objective 2.0: Understand health care and quarantine purposes					
	Explain the feeds and feeding requirements of cattle. Explain requirements for dry season feeding e.g. browse plants and crop residues, hay and silage production (forage consolation)	Describe 2.1 & 2.2		Describe the cattle feeding requirements including continuous access to clean water. Protein which is essential for growth and milk production. Energy: needed for daily activities and maintenance. Vitamins are Important for bodily functions and immunity.	Explain and illustrate the digestive system of ruminants, focusing on the role of the rumen in the digestive processes of cattle.	Visit to modern farm and animal research institute (NAPRI Zaria & NVRI Vom, Jos

				Minerals are key for bone health and metabolism. In the dry season, nutritional alternatives when fresh forage are scarce. Hay and Silage are needed for a steady supply of forage.		
	General Objective 3.0: Understand the various management systems needed at various ages.					
	3.1 Explain some basic management systems of the following classes of cattle - Colt, heifers, in-cow, bull, and dairy cow.	Describe the management of each class as it affects their growth stages, reproduction, and general performance		Explain some basic management systems for the following classes of cattle: colts, heifers, in-calf cows, bulls, and dairy cows.	Discuss how the management of each class impacts their growth stages, reproduction, and overall performance.	Farm visits and other relevant institutions for a study tour
	General Objective 4.0: Know the reproductive activities in cattle production					
	4.1 Define maturity in cattle 4.2 Explain the symptoms shown when cattle are on heat. 4.3 Explain abortion.	Describe 4.1 & 4.2.	Diagrams/ pictures.			

	4.4 State the likely causes of abortion in cattle 4.5 State measures to prevent abortion in cattle.	Describe the term abortion and its causes. Describe the likely causes of abortion in cattle. Discuss measures to prevent abortion in cattle.				
	General Objective 5.0: Understand record-keeping.					
	5.1 State the importance of keeping good records 5.2 Keep proper record of farm activities 5.3 Explain cost-benefit analysis 5.4 Analyse the record book for evaluation or auditing	Discuss the importance of maintaining accurate records for effective farm management, Discuss the need for a cost-benefit analysis helps farmers understand the profitability of their operations.				

	General Objective 6.0: Understand milking procedures in cattle production					
	6.1 Define milk. 6.2 Explain milking procedures in cow. 6.3 Explain the use of the following products from cattle beef, blood, bones, hides, horns etc 6.4 Describe hygiene during milking.	Explain milk. Describe various methods of milking (Hand/machine) Discuss the importance of the products in 6.3 Discuss hygiene during milking. Discuss milk handling and storage Describe the importance of this product to the farmer and country.		Know the milking procedures	Demonstrate the process of extracting Milk from mammals	Visit to farm and animal research institute
	General Objective 7.0: Know how to select replacement stock					
	7.1 List the features to look out for in selecting a good heifer or bulls.	Describe the important anatomical features to look out for in selecting a heifer e.g., 4 teats, bulls' strong legs, etc.		Identify key anatomical features to consider when selecting a heifer, such as having four teats and strong legs like	Guide students to identify key anatomical features to consider when selecting a heifer, such as having four teats and	Visit modern farms, animal products processing factories (Sabore, L&Z, etc.), and animal research institutes

	7.2 Explain the importance of heifers. 7.3 Explain the importance of b u l l s .	Describe the importance of bulls and heifers.		those of bulls. Carryout selection method of a good heifer or bull based on conformation, health, genetic lineage, and reproductive traits etc.	strong legs like those of bulls. Demonstrate, Identify key anatomical features to consider when selecting a heifer.	

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: RABBIT PRODUCTION III		**COURSE CODE:CPP 323**	**CONTACT HOURS: 48**
YEAR: 3	**TERM:** 2	**PRE: REQUISITE:**	**Theoretical:** 24 Hours **Practical:** 24 Hours
GOAL: This module is designed to introduce the students to basic rabbit production practices			

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1.0: understand the characteristics, types and problems of rabbits
2.0: Features of a good housing for rabbits
3.0: Understand the kindling and care of rabbits
4.0: Know the importance of feeding rabbits
5.0: Know the digestion of feed in Rabbit
6.0: Know record keeping in rabbits
7.0: Understand processing in rabbits

PROGRAMME:NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: RABBIT PRODUCTION III				**CODE: CAH323**	**CONTACT HOURS: 48**	
COURSE SPECIFICATION: THEORITICAL CONTENT 24HOURS				**PRACTICAL CONTENT: 24 HOURS**		
	GENERAL OBJECTIVE 1.0: understand the characteristics, type and problems of rabbits					
WEEK	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECEFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Explain the routine management practices in rabbit Keeping 1.2Explain how to handle rabbits	Describe the routine management practices in rabbit Keeping Describe the methods of handling rabbits on the farm		Carry out identification of rabbits e.g. ear notching, tattooing tags etc. Carry out identification methods and vaccination.	Show students how to carryout identification of rabbits, e.g. ear notching, tattooing tags etc. Show students identification methods and vaccination.	Ear tag applicator, Live rabbits and rabbit vaccines
	General Objective 2.0: Understand features of a good housing for rabbits.					
	2.1 Name important features of rabbits housing. 2.2 Explain important features of rabbits housing. 2.3 Explain materials in use for constructing rabbit housing	Outline the features of good housing in rabbit production. Describe 2.2 & 2.3		Identify different features of rabbitry.	Guide students to identify the features of good housing in rabbit production	Rabbit farm visit

	General Objective 3.0: Know the kindling and care of rabbits					
	3.1 Define kindling 3.2 Describe the appearance of the young 3.3 State the care of Doe to kitten 3.4 State period of weaning 3.5 Explain precautions involved in handling kitten 3.6 State the predators of rabbits 3.7 State time of rebreeding rabbit 3.8 State cause of abortion in rabbit. 3.9 State cause of infertility in Rabbit	Discuss 3.1 – 3.9		Identify the signs of kindling . Prepare nest box for kindling.	Assist student in identifying the signs of kindling. Guide students to prepare nest box for kindling	Rabbit farm visit

	General Objective 4.0: Know the importance of feeding rabbits					
	4.1 Explain symptoms of nutrient deficiencies in rabbits. 4.2 Explain feed utilization in Rabbit. 4.3 Describe how to compound rabbit ration 4.4 What is coprophagy in rabbits	List the symptoms of nutritional imbalance in rabbit feed. Explain how to compound ration diets using Pearson square etc. State the importance of coprophagy in rabbit nutrition		Carryout feed compounding for rabbit	Demonstrate how to compound feed for rabbits.	Rabbit feed formulation
	General Objective 5.0: Know the digestion of feed in Rabbits					
	5.1 Define digestion, 5.2 List the organs for digestion. 5.3 Explain the digestive system of rabbit. 5.4 Explain coprophagy	Describe the digestive system of Rabbit State the importance of each stage to rabbit nutrition Outline the differences in digestive system of rabbits and Ruminant State the similarities in the digestive system of rabbit and ruminants, e.g. cecum		Show the digestive system of rabbit and differentiate it from other ruminant animals	Assist students in differentiating digestive system of rabbit and other ruminant animals	Draw the digestive system of rabbit and other ruminant animals

	General Objective 6.0: Know record keeping in rabbits					
	6.1 Describe record keeping. 6.2 State the importance of record keeping. 6.3 Explain the different types of records keeping	Explain record keeping. Discuss the importance of record keeping. List the different types of records e.g. breeding, feed, live weight etc.				

General Objective 7.0: Understand processing in rabbits						
	7.1 Explain the equipment use for processing rabbit. 7.2 State the different processing methods in Rabbits. 7.3 State the importance of slaughtering and processing Rabbit.	Describe the equipment use for processing rabbit Explain the various processing methods in rabbit. Explain the importance of the products by-products.		Identify the equipment used for processing rabbits. Carryout processing of rabbits E.g. flaying (skinning). List the processing procedures in rabbits	Guide students to identify equipment use for processing rabbits.	Rabbit processing equipment. Rabbit, knives hot cat table,

	7.4 Explain the uses of rabbit products and by- products Blood, fur, faeces.	1 Describe the uses of rabbit products and by- products Blood, fur, faeces.			Demonstrate slaughtering and processing of rabbit	

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: SWINE PRODUCTION III		**COURSE CODE: CAH 324**	**CONTACT HOURS: 36**
YEAR: 3	**TERM: 2**	**PRE-REQUISITE:**	**THEORETICAL: 24 HOURS** **PRACTICAL: 12 HOURS**

GOAL: This module is designed to expose students to the routine management and processing of pigs.

GENERAL OBJECTIVE: Upon completing this module, the trainee is expected to demonstrate the ability to.

7 Know the breeding systems in pigs
8 Know the nutritional requirements of pigs
9 Know the care and management of pigs.
10 Understand the routine management practices in pigs
11 Understand record keeping in pig management
12 Understand the processing of pigs.

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: SWNE PRODCTION III				**CODE: CAH 324**	**CONTACT HOURS: 36**	
COURSE SPECIFICATION: THEORETICAL CONTENT 24HOURS				**PRACTICAL CONTENT: 12 HOUS**		
	GENERAL OBJECTIVE 1.0: Know the breeding systems in pigs.					
WEEK	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**	**SPECIFIC LEARNING OBJECTIVES**	**TEACHERS ACTIVITIES**	**LEARNING RESOURCES**
1&2	1.1 Define breeding. 1.2 Explain breeding, crossbreeding and inbreeding. 1.3 List the merits and demerits of breeding systems. 1.4 Explain problems of infertility in pigs. 1.5 List the male and female sex hormones. 1.6 Describe the male and female reproductive tracts.	Discuss 1.1 &1.2 Discuss the merits and demerits of breeding. Explain the causes of infertility in pigs Discuss male and female sex hormones		Carryout breeding in pigs	Demonstrate breeding in pigs.	Farm visit
	General Objective 2.0: Know the nutritional requirements of pigs.					
	2.1 State the nutritional requirements of pigs (from day old to finishing)	Explain the nutritional requirements of pigs (from day old to finishing).		Show/ demonstrate the different life cycle phases of pigs.	Illustrate the different life cycle stages of pigs.	Farm visit and feed mill

	2.2 State the feed requirements for piglets. 2.3 State the feed requirements for growers. 2.4 State the feed requirements for fattener. 2.5 State the feed requirements for breeder. 2.6 State the feed requirements for finisher	Describe the feed requirements for piglets, grower, fattener, breeder, and finisher				
	General Objective 3.0: Know the care and management of pigs.					
4&5	3.1 Explain the need for the provision of adequate housing that is well-ventilated, insulated, and spacious to accommodate the pigs' natural behaviors. 3.2 Explain the need for a clean environment to prevent the spread of diseases and should allow the pigs to express their innate behaviors, thereby enhancing their welfare. 3.3 Explain essential nutritional management for optimal growth and reproduction. A balanced diet, tailored to the specific growth stages of pigs, must be provided	Explain the different methods and procedures of care and management of pigs in terms of their housing, disease prevention, and nutritional requirements for their specific growth stages				

	General Objective 4.0: Understand the routine management practices in pigs.					
	4.1 List the major routine management practices in pig rearing. 4.2 Describe the following activities carried out in pig rearing: - i) identification ii) infant teeth chipping iii) castration iv) ear notching 4.3 Describe the importance of routine management in pig rearing.	Discuss management practices in pig rearing Demonstrate routine management practices like - identification - teeth chipping - castration - ear notching Discuss the importance of routine management in pig rearing.		Carry out routine management practices as in 4.1 & 4.2.	Guide students to Carry out routine management practices as in 4.1 & 4.2.	Farm Visit
	General Objective 5.0: Understand record keeping in pig management					
	5.1 Know the importance of record-keeping in pig Production as a means for successful and profitable pig production. 5.2 list types of record keeping in swine production 5.4 categorize the types of record in 5.2 above into inventory, performance and health records.	Describe 5.1 – 5.3				

	General objective 6.0: Understand the Processing of pigs					
	6.1 State the importance of slaughtering and processing pigs. 6.2 List the different types of slaughtering equipment. 6.3 Outline the processes and procedures for slaughtering. 6.4 Describe the slaughtering process in detail. 6.5 List the uses of by-products from slaughtering. 6.6 Differentiate between offal and carcass.	Discuss 6.1 – 6.6		Identify the different types of slaughtering equipment.	Guide students to Identify the different types of slaughtering equipment.	

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION			
MODULE: INTRODUCTION TO POST HARVEST TECHNOLOGY AND MARKETING (THEORETICAL AND PRACTICAL)		**COURSE CODE: CFT 331**	**CONTACT HOURS: 48**
YEAR: 3	**TERM:** 3	**PRE: REQUISITE:**	**Theoretical:** 48 Hours **Practical:** 48 Hours
GOAL: This module is designed to acquaint students with the knowledge of fish handling, preservation, processing and marketing.			

GENERAL OBJECTIVES:

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

1.0 Understand the nutritive value of fish in the diet.
2.0 Understand various fish handling methods, equipment and know the techniques of evaluating freshness and spoilage of fish.
3.0 Understand various causes of fish spoilage and know methods and equipment used in fish processing and preservation.
4.0 Understand various methods of fish processing and preservation and marketing.

PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION						
MODULE: INTRODUCTION TO POST HARVEST TECHNOLOGY AND MARKETING				**COURSE CODE: CFT 331**		**CONTACT HOURS: 48**
YEAR: 3	**TERM:** 3	**PRE: REQUISITE:**		**Theoretical:** 24 Hours **Practical:** 24 Hours		
GOAL: This module is designed to acquaint with knowledge of fish handling preservation, processing and marketing						
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: Understand the nutritive value of fish in the diet						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1 - 2	1.1 Outline the nutritional composition of fish 1.2 Outline the importance of fish in human nutrition. 1.3 List other uses of fish e.g. as a source of oil, jewelry, leather, fish cake etc. 1.4 Describe the effect of temperature on keeping quality of fish. 1.5 Describe the effect of gutting on keeping quality of fish	Explain the nutritional composition of fish and its importance in human nutrition. Explain various uses of fish listed in 1.3. Explain 1.4 – 1.5		1.1 Identify common fish handling equipment:- (a) Onboard (b) At Landing site (c) Off shore Perform gutting of fish in relation to Keeping the quality of fish.	Show students common fish handling equipment listed in 1.1. Guide students on gutting of fish in relation to Keeping the quality of fish.	Freshly caught fish, knives, ice pack etc.

GENERAL OBJECTIVE 2.0: Understand various handling methods, equipment and know the techniques of evaluating freshness and spoilage of fish						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
3 - 4	2.1 List common fish handling equipment (a). Onboard (b). At Landing site (c). Off shore 2.2 Enumerate the uses and maintenance of common fish handling equipment. 2.3 Enumerate various fish handling methods. 2.4 Outline how the various fish handling methods affect the quality of fish.	Describe various handling equipment commonly used by fisher folk and their maintenance. Describe various fish handling methods and their effects on fish quality.		2.1 Identify the physical properties of freshly caught fish e.g. eyes, gut, gill appearance and flesh. 2.2 Identify changes that occur in fish stored at various temperatures on the flesh, eyes, gills and general appearance. 2.3 Identify signs of deterioration in fish e.g. off colour, off odour, flabbiness.	Show physical properties of freshly cut fish. Conduct visual assessment of fishes stored under different environmental conditions e.g. temperature, moisture. Demonstrate the methods of identifying signs of deterioration in fish e.g. off colour, off odour, flabbiness	Freshly caught fish. Deteriorating fish

GENERAL OBJECTIVE 3.0: Understand various causes of fish spoilage and know the methods and equipment used in fish processing and preservation.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
5 - 7	3.1 List the causes of fish spoilage. 3.2 List of factors responsible for spoilage of fish (a). Bacteria (b). Enzymes (c). Chemical oxidation 3.3 Explain locations/site of the microorganisms on the fish. 3.4 Outline spoilage organisms of fish and their control measures. 3.5 Outline the characteristics of freshly caught and deteriorating fish.	Discuss the causes of fish spoilage. Explain factors responsible for fish spoilage e.g. bacteria, enzymes, chemical oxidation. Describe the locations/site of the microorganisms on the fish. Explain spoilage organisms of fish and methods of controlling them. Explain the differences between freshly caught and deteriorating fish.		3.1 Identify the equipment used for processing and preserving fish. 3.2 Process fish by any of the following methods: - boiling, frying, smoking, sun drying, salting, fermentation, etc. 3.3 Preserve fish by any of the following methods: - chilling, icing, freezing, brining.	Show students various equipment used for processing and preserving fish. Demonstrate various methods of processing and preserving fish listed in 3.2 and 3.3. Guide students to design simple smoking kilns, salting vat.	Pots, frying pans, fish smoking kiln, Ice box, Deep freezer/ refrigerator, Trays, Fish racks, etc.

				3.4 Design simple smoking kilns, salting vat.		
GENERAL OBJECTIVE 4.0: Understand various methods of processing and preserving fish.						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
8 - 12	4.1 Describe the various fish processing methods e.g. boiling, frying, smoking, sun drying, salting, fermentation, canning etc. 4.2 Describe the various preservation methods e.g. chilling, icing, freezing, brining etc. 4.3 List the equipment for each method in 4.1 & 4.2 above. 4.4 Differentiate between icing, freezing and cold storage (chilling). 4.5 Outline the advantages and	Discuss various fish processing methods listed in 4.1 Discuss various fish preservation methods in 4.2. Describe various equipment used in processing and preserving fish. Enumerate the differences between icing, freezing and cold storage (chilling). Explain the advantages and	Pots, frying pans, fish smoking kiln, ice box, deep freezer/refrigerator. Trays, fish racks. Canned fish products. Chart showing marketing distribution channels.			

	disadvantages of each of the methods in 4.1 & 4.2 above. 4.6 List the forms of fish for marketing. 4.7 Describe outlets for marketing the following: - -. Fish seed - Table fish - Shell fish - Ornamental fish etc. 4.8 List constraints associated with fish marketing.	disadvantages of various methods of processing and preserving fish. Mention various forms of fish for marketing. Explain various means and stations for marketing fish. Explain the problems experienced in fish marketing.				

<table>
<tr><td colspan="4">PROGRAMME: NATIONAL TECHNICAL CERTIFICATE IN LIVESTOCK PRODUCTION</td></tr>
<tr><td colspan="2">MODULE: INTRODUCTION TO BEE PEST, PREDATATIORS, DISEASES, HONEY HARVESTING AND PACKAGING</td><td>COURSE CODE: CBK 331</td><td>CONTACT HOURS: 48</td></tr>
<tr><td>YEAR: 3</td><td>TERM: 3</td><td>PRE: REQUISITE:</td><td>Theoretical: 24 Hours
Practical: 24 Hours</td></tr>
<tr><td colspan="4">GOAL: This module is designed to introduce the students to the bee keeping practices</td></tr>
<tr><td colspan="4">GENERAL OBJECTIVES:

On completion of this module, the students should be able to:

1.0 Understand bee pest and disease control.
2.0 Understand honey harvesting and packages.
3.0 Understand packaging of honey products.</td></tr>
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PROGRAMME: NATIONAL TECHNICAL CERTIFICATE LIVESTOCK PRODUCTION						
MODULE: INTRODUCTION TO BEE PEST, PREDATATIORS, DISEASES, HONEY HARVESTING AND PACKAGING				**COURSE CODE: CBK 331**		**CONTACT HOURS: 48**
YEAR: 3	**TERM:** 3	**PRE: REQUISITE:**		**Theoretical:** 24 Hours **Practical:** 24 Hours		
GOAL: This module is designed to introduce the students to the Beekeeping practices.						
Theoretical Content				**Practical Content**		
GENERAL OBJECTIVE 1.0: Understand the bee pest and disease control						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1-4	1.1 List bee pests and diseases. 1.2 List the methods of controlling pests and diseases in colony	Describe bee pests and diseases, Explain methods of pest control and disease in different hive colony	Internet, Pictures and textbooks	1.1 Identify the bee pests and disease in the colony. 1.2 Demonstrate signs and symptoms of each disease and pest in hive colony	Guide students to identify the various pest and disease in colonies Guide students to identify signs and symptoms of bee disease	Hive, picture, audio visuals Projector.

GENERAL OBJECTIVE 2.0: Introduction to honey harvesting, processing and packaging						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
5-7	2.1 Describe the methods of honey harvesting. 2.2 outline the good quality of a honey product 2.3 list the safety precaution rule to be observed in honey harvesting and extraction 2.4 Explain the application of safety precaution in honey harvesting. 2.5 List the types of fitter used for honey extraction.	Explain the methods of honey harvesting. Describe the good quality of honey product. Discuss the safety precaution rule to be observed in honey harvesting and extraction Discus the application of safety precaution in honey harvesting. Explain the types of fitter used for honey extraction.		Select suitable method of honey harvesting Demonstrate the safety precaution rule observed in honey harvesting Identify the application of safety precaution in honey harvesting 10.4 Identify the fully capped combs for honey harvesting. Demonstrate and Select fully copped combs for homey harvesting.	Guide students to select suitable methods of honey harvesting. Carryout safety precaution rule in honey harvesting Guide students to select safety equipment and wear essential in honey harvesting Guide students to identify the fully capped combs for honey harvesting. Select the fully capped combs for the honey harvesting	Honey press, knives, training cloth centrifugal extractor. Honey settling tank weighing scale refractometer and assorted containers.

				Demonstrate equipment and materials used in honey extraction Demonstrate types of fitter used for honey extraction.	Guide students on the use of equipment and materials in honey extraction Guide students on how to use fitter in honey extraction	
GENERAL OBJECTIVE 3.0: Understand packaging of honey products						
Week	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**	**Specific Learning Outcome**	**Teachers Activities**	**Learning Resources**
1	3.1 Explain honey packaging 3.4 Define honey marketing 3.5 Explain marketing honey strategies	Discuss honey packaging Explain honey marketing Discuss the marketing strategies used for honey		Select the appropriate packaging material for honey. Demonstrate how to packaging honey. Identify the suitable market for honey production.	Guide student to identify appropriate packaging honey Guide students on how to package honey Guide student to select right market for honey.	Honey press, knives, training cloth centrifugal extractor. Honey settling tank weighing scale refractometer and assorted containers.

LIST OF TOOLS AND EQUIPMENT

S/N	TOOLS AND EQUIPMENT	QUANTITY REQUIRED
1	Bee hives (langstroth, Kenyan and traditional hives	20 hives
2	Bee smoker	6 smoker
3	Honey processing machines	2
4	Honey refractometer	1
5	Comb knife	10
6	Bee protective wear	10
7	Bee brush	5
8	Centrifuging toney extractor	2
9	Catcher box swarm	5
10	Solar wax extractor	2
11	Bee opener	10
12	Royal jelly extractor	2
13	Gum boots	10
14	Straining cloth	2
15	Honey setting tank	3
16	Processing honey room or lab	1
17	Honey capping knife	5
18	Bee feeder	5
19	Plastic bucket	10
20	Recording book and calendar	2
FISHERIES TECHNOLOGY		
1	Dissolved Oxygen (DO) Meter	2
2	PH Meter	2
3	Conductivity Meter	2
4	Thermometer	30
5	Water Testing Kits	2

6	Microscope	3
7	Magnifying Glass	20
8	Aquaria Tanks	5
9	Hatching Trough	5
10	Nursery Tanks/ Ponds	3
11	Demonstration Ponds	2
12	Scoop Net	7
13	Aerators And Accessories	10
14	Plastic Sieves	10
15	Compounded Feeds	15
16	Grinding/ Milling Machine	2
17	Milling Machine	2
18	Pelleting Machine	2
19	Dissection Kits	2
20	Water Pumps	2
21	Secchi Dich	2
22	Model Gillnet	1
23	Model Castnet	1
24	Model Siene Nets	1
25	Model Traps	1
26	Model Hook And Line	3
27	Model Trawl Net	1
28	Netting Materials	
29	Nylon Ropes	1
30	Hooks Packets	20
31	Mounting Twine	1
32	Canoe	1
33	Paddles	2
34	Gutting Knives	15
35	Measuring Boards	5

36	Weighing Balance	2
37	Hand Gloves	30
38	Freezers	2
39	Ovens	2
40	Kilns	2
41	Fish Drying Racks	2
42	Fish Boxes	5
43	Salting Trays/ Basins	5
44	Sun drying Mats	5
45	Baskets	10
POULTRY		
1	Feeders	10
2	Drinkers	10
3	Incubator small(30-60) capacity	3
4	Biosecurity equipment	4
5	Feed mixing and grinding machine	1
6	Computer and printer	2 sets
7	Vaccination equipment	2 sets
8	Nutrient analysis equipment	2
9	Refrigerator	2
10	Slaughter and evisceration equipment	2
11	Broiler chicks	50
12	Broiler feeds	5bags
13	Layer chicks	50
14	Layer feeds	5bags
15	Antibiotics	5 packs
16	Multivitamins	5
17	Transportation crate	2
18	Hardcover books	5
19	Writing materials(Biros, ruler)	20

SWINE		
1	Pig boar	1
2	Gilt	2
3	Pig net	2
4	Scales	2
5	Measuring tape	2
6	Artificial insemination kit	2
7	PPE	3sets
8	Pregnancy test kit	3
9	Disinfectant spray	5
10	Ear tag applicator	5
11	Feed sampling equipment	2
SHEEP AND GOAT		
1	Ram	3
2	Ewe	2
3	Buck	2
4	Doe	2
5	Measuring tape	2
6	Artificial insemination kit	2
7	PPE	3sets
8	Pregnancy test kit	3
9	Disinfectant spray	5
10	Ear tag applicator	5
11	Feed sampling equipment	2
12	Antibiotics and vitamins injection	5 sets
13	Feeds (wheat offal, maize bran ,GNC,)	5bags each

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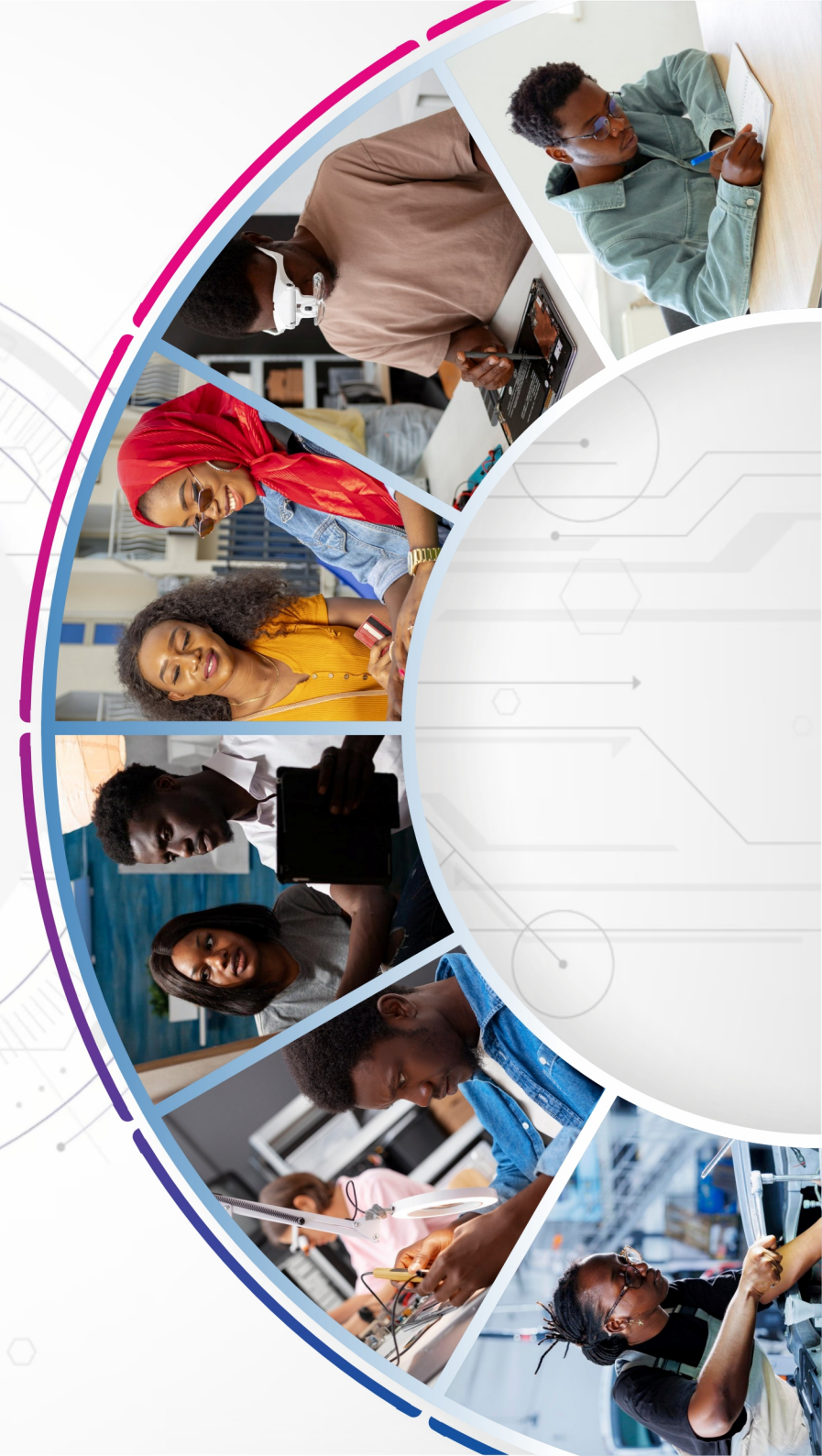

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