

NATIONAL BOARD FOR TECHNICAL EDUCATION, KADUNA

NATIONAL VOCATIONAL CERTIFICATE

IN

AGRICULTURE

CURRICULUM AND COURSE SPECIFICATIONS

2007

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

NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.

Goal

The National Vocational Certificate In Agriculture is designed to produce on – farm, skilled and practical oriented farmer, capable of carrying out specific farming activities for a living.

Objectives

- Set up and maintain farm enterprise in crop productions, processing and marketing.
- Carry out the establishment, maintenance and management of orchards and tree crops plantations.
- Set up an enterprise in animal health.
- Establish an enterprise in ruminant and non ruminant animals production, poultry and piggery.
- Establish and manage a business in bee – keeping, cattle breeding, snail farming, mushroom cultivation and fish farming.
- Establish and maintain animal pasture and forage
- Set up an enterprise for feed formulation

ENTRY QUALIFICATION:

The minimum entry qualification into the National Vocational Certificate in Agriculture is

- Post Basic Education Certificate (Post JSS) and also the followings:
- Post secondary students who are unable to gain access to higher education or IELs, who may have less than 5 credits
- Those out of school for a long time.

STRUCTURE OF PROGRAMME:

- The National Vocational Certificate (NVC) in Agriculture is in flexible modular form, and is structured to have three terms (i.e. NVC term I, NVC term II and term III) each taken in a span of one year. Each part shall have a cogent and flexible structure content that would allow the trainee practical working skill unit and the possibility to exit at that level.

Each part incorporates six months intensive training in the school and three months of supervised industrial work experience (SIWES).

In a 12 weeks term, 10 weeks will be for academic activities while two weeks will be for registration and Evaluation. For a 30 weeks, 5 hours will be for core theory courses, 2 hours General Education courses, 3 hours for foundation courses and 20 hours will be for practical.

EVALUATION SCHEME:

THE National vocation Certificate Examination must be externally moderated. In grading the awards; theory shall constitute 20%. Practical 50% and SIWES 30%.

**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
CURRICULUM TABLE**

YEAR I TERM 1

Code	Course	Lecture	Practical	Contact Hours	Credit Unit
	<u>GENERAL STUDIES MODULES</u>				
*CSK 101	Use of Library	1	-	10	1
	<u>FOUNDATION MODULES</u>				
BSB 111	Introduction to Biology	1	2	30	2
^BSM 111	Basic Mathematics	1	-	10	1
-VCS 103	Introduction to Computer	1	2	30	2
	<u>TRADE MODULES</u>				
VAE 111	Introduction to General Agriculture	2	4	60	3
VAE 112	Vegetable Gardening	1	4	50	3
VAE 113	Pasture and feeds Production	1	4	50	3
VAE 114	Micro livestock Production	1	4	50	3
	TOTAL	9	20	290	18

* See Vocational GNS English Syllabus

^ See Vocational Mathematics Syllabus

- See Vocational Computer Studies Syllabus

**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
CURRICULUM TABLE**

YEAR I, TERM 2

Code	Course	Lecture	Practical	Contact Hours	Credit Unit
	<u>GENERAL STUDIES MODULES</u>				
*EDP 101	Element Of Entrepreneurship	2	-	20	1
	<u>TRADE MODULES</u>				
VEA 121	fish Farming	1	3	40	3
VAE 122	Feed Processing and Formulation	1	3	40	3
VAE 123	Animal Traction	1	3	40	3
Vae 124	Swine Production	1	2	30	3
VAE 125	Agro Forestry Practice	1	3	40	3
VAE 126	Animal Health	1	3	40	3
VAE 127	Workshop Practice	1	3	40	3
	TOTAL	9	20	290	22

* See Vocational Entrepreneurship Curriculum

**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
CURRICULUM TABLE**

YEAR I TERM 3:

Industrial Training (3 Months).

NVC in Agriculture (Draft)

**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
YEAR 2 TERM 1**

Code	Course	Lecture	Practical	Contact Hours	Credit Unit
	<u>GENERAL STUDIES MODULES:</u>				
* CSK 202	Comprehension and Summary	1	-	10	1
	<u>FOUNDATION MODULES</u>				
BSB 211	Plants and Soil Biology	1	2	30	2
○ BSM	Mathematics	1	-	10	1
211	Computer Package 1 (MS Word)	1	2	30	2
❖ VCS105	<u>TRADE MODULES</u>		5		4
	Crops Production Techniques	1	4	50	3
VAE 211	Tree Crops Production	1	3	40	3
VAE 212	Cattle Production	1	3	40	3
VAE 213	Farm Structure	1	3	40	3
VAE 214	Agricultural Machines and Implement Maintenance I	1	3	40	3
VAE 215	TOTAL	9	20	280	21

- * See Vocational GNS English Curriculum
- See Vocational Mathematics Curriculum
- ❖ See Vocational Computer Studies Curriculum.

**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
CURRICULUM TABLE**

YEAR 2, TERM 2

Code	Course	Lecture	Practical	Contact Hours	Credit Unit
	<u>GENERAL STUDIES MODULES</u>				
- EDP 102	Element Of Entrepreneurship	1	-	10	1
	<u>FOUNDATION MODULES</u>				
BSB 221	Animal Biology	1	2	30	2
	<u>TRADE MODULES</u>				
VAE 221	Floriculture	1	3	40	3
VAE 222	Crop Processing	1	3	40	3
VAE 223	Nursery Techniques	1	3	40	3
VAE 224	Planting and Weeding Techniques	1	3	40	3
VAE 225	Tractor and Implement Operations	1	4	50	3
VAE 226	Agricultural machines and Implement Maintenance II	1	3	40	3
		8	21	290	20

- See Vocational Entrepreneurship Curriculum

NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE

CURRICULUM TABLE

YEAR 2 TERM 3

Industrial Training (3 Months).

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**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.
CURRICULUM TABLE**

YEAR 3 TERM 1

Code	Course	Lecture	Practical	Contact Hours	Credit Unit
	<u>GENERAL STUDIES MODULES</u>				
* CSK 302	Essay Writing	1	-	10	1
- EDP 103	Element of Entrepreneurship	1	-	10	1
	<u>FOUNDATION MODULES</u>				
\ VCS 104	Computer Package 11 (Excel)	2	4	60	3
	TRADE MODULES				
VAE 311	Bee Keeping	1	4	50	3
VAE 312	Goat and Sheep Production	1	4	50	3
VAE 313	Farm Record Keeping	1	4	50	3
VAE 314	Dairy Processing	2	4	60	3
		9	20	290	17

- * See Vocational GNS English Curriculum
- See Vocational Entrepreneurship Curriculum
- \ See Vocational Computer Studies Curriculum

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**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
CURRICULUM TABLE**

YEAR 3 TERM 2

Code	Course	Lecture	Practical	Contact Hours	Credit Unit
	<u>FOUNDATIONMODULES</u>				
BSB321	Ecology	1	2	30	2
	<u>TRADE MODULES</u>				
VAE321	Snail Farming	1	2	30	2
VAE322	Mushroom Production	1	2	30	2
VAE323	Poultry Production	1	4	50	3
VAE324	Orchard Practice and Maintenance	1	3	40	3
VAE325	Pest Management	1	2	30	2
VAE326	Storage Structures	1	3	40	3
VAE327	Harvesting and Post Harvest Management	1	2	30	2
		8	20	280	19

**NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
CURRICULUM TABLE**

YEAR 3 TERM 3

Industrial Training (3 Months).

NVC in Agriculture (Draft)

Programme: National Vocational Certificate in Agricultural Enterprise

Module: BSB 111, Introduction to Biology

Duration: 30 hours (1 theory, 2 hours practical)

Unit: 2.0

Goal: This module is designed to introduce the trainee to the fundamental of basis of living

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

1. Understand the general characteristics of living and non-living things
2. Know the differences between plants and animals
3. Understand the basic classification of plants and animals
4. Understand the structure of the cell
5. Know the various stages of cell division
6. Understand the basic concept of genetics

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE:: Introduction to Biology			COURSE CODE: BSB 111		CONTACT HOURS: 30 hours (1hr theory, 2 hours practical)	
GOAL: This module is designed to introduce the trainee to the basis of living						
COURSE SPECIFICATION: Theoretical Contents:						
1.0	General Objective: 1.0 Understand characteristics of living and non-living things			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Explain living and non-living things	Discuss the differences between living and non-living things				
	1.2 Describe the characteristics of living things					
	1.3 Describe the characteristics of non-living things.					
	1.4 Explain the virus as a living thing	Discuss the structure of the virus	Diagrams of virus			
General Objective 2.0 Know the differences between plants and animals						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 List the characteristics of plants	Explain the characteristics of plants				

NVC in Agriculture (Draft)

	2.2 List the characteristics of animals	Explain the characteristics in 2.2				
	2.3 Differentiate between plants and Animals.	Discuss the differences in 2.3	Table			
	2.4 Describe Euglena as a living thing	Explain the structure of Euglena	Diagrams			
3.0	General Objective 3.0 Understand the classification of plants and animals.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	3.1 Explain the principles of classifying Plants and animals.					
	3.2 Classify plants and animals into their different phylum and classes	State the characteristics features of each phyla and class with examples		3.2 Carry out simple experiments on classifying plants and animals	Classify given organisms into appropriate groups based on their characteristics	
	3.3 Describe the external features and life history of selected members of a phylum/class	Explain the life history of 3.3		.		
4.0	General Objective 4.0 Understand the structure of the cell					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	4.1 Describe the major differences between plant and animal cell	Name the various organelles in a cell	Slides	Observe cells of onion/check under a microscope draw and label the various organelles	Guide trainee to draw and label cells observed	Slides Microscope

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General Objective: 5.0 Know the stages of cell division						
5.1 Explain mitosis and meiosis	Explain the stages of cell division in mitosis and meiosis			Observe the various stages of cell division in mitosis and meiosis on the microscope	Explain the cells where mitosis and meiosis occur	Slides Microscope
5.2 State the differences between mitosis and meiosis	Explain the significance of mitosis and meiosis					
General Objective: 6.0 Understand the basic concepts of genetics						
6.1 Define genetics	Explain the application of genetics in agriculture.					
6.2 Define the terms: Genes, Chromosomes Dominance Recessive hybrid Genotype, phenotype, Allelomorphs, Filial Generation, Back cross, Comp[plete dominant, Incomplete dominant, dihybrids cross.	Explain the terms in 6.2					
6.3 State the Emendations Law	Explain the result of a simple monohybrid cross hybrid punnet square					
6.4 Describe sex determination	Explain the determination in mammals					

NVC in Agriculture (Draft)

Programme	:	National Vocational Certificate In Agriculture
Module	:	VAE 111, Introduction to General Agriculture
Duration	:	60 hours (1 hour theory, 4 hours practical)
Unit	:	3.0
Goal	:	This module is designed to acquaint the trainee with the basic knowledge of agriculture.

General Objectives:

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

1. Understand the basic principle of crop science.
2. Understand the basic principles of animal science
3. Understand the meaning and scope of forestry.
4. Understand the scope of fisheries.

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.						
COURSE: Introduction to General Agriculture			COURSE CODE: VAE 111		CONTACT HOURS: 60 hrs	
GOAL: This module is designed to acquaint the trainee with the basic knowledge of agriculture.						
COURSE SPECIFICATION: Theoretical Contents: 1 hr				Practical Contents: 4 hrs		
General Objective: Understand the basic principles of crop science.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	1.1 Outline the history of agricultural development in Nigeria.	Discuss the history of agricultural development in Nigeria.				
	1.2 List types of farming systems such as: - Mono cropping - Mixed cropping - Relay Cropping - Shifting Cultivation - Plantation Farming	Explain the types of farming systems.				
	1.3 Describe the types of farming systems listed in 1.2 above					
	1.4 Explain the effect of farming systems on crop yield.	Describe the effect of the farming systems on crop yield.				

NVC in Agriculture (Draft)

2-3	1.5 Identify types of storage for crops such as tuber crops, cereals and Pulses, fruits and vegetables.	Describe the storage of tuber crops cereals fruits and vegetables.		1.4 Carry out the storage of tuber crops cereals/pulses fruits and vegetables.	Guide the trainee to store the crops.	Cereals Pulses, Fruits <ul style="list-style-type: none"> • Vegetables • Rhumbus • Barns • Silo • Sacks
	1.6 Identify the problem of labour in crop Production.	Explain the problem of labour in crop production.		1.5 Carry out labour practices at the farm.	Guide the student to carry out the task.	
	1.7 Explain the effect of other sectors of economy such as: <ul style="list-style-type: none"> - energy - inflation & wages - roads and transportation - storage facilities on the farm industry. 	Describe the effects to the trainee.				
4	1.8 Explain the effect of environment such as biological and soil factors such as water and nutrient characteristics, soil structure and texture, pest and insecticides on crop production.	Describe the factors to the trainee.				
	1.9 Describe control terracing and methods of erosion control.	Explain the methods to the trainee.				

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	1.10 Describe the method of land preparation for large scale crop production and the types of implements used in mechanical and Manual methods.	Explain the procedures to the trainee including their merits and demerits.				
5	1.11 Explain seed quarantine in terms of purity, viability and reliability.	Describe the procedure to the trainee.				
	1.12 List the various planting methods practice in Nigeria.	Explain the methods to the trainee.				
General Objective: 2.0 Understand the basic principles of animal science.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
6	2.1 Explain the inter-relationship between crop production and animal production: - Hay production - Forage - Fodder - Animal manure - Crop residues	Discuss the inter-relationship to the trainee.		2.1 Identify the traditional and modern storage systems.	Explain and guide the trainee to carry out the classification	
	2.2 List important farm animals in Nigeria and their products: cattle – Milk Beef Hides, Skin Horns & hoof Bones Sheep & Goat - Meat Milk Skin	Explain their importance to the trainee		2.2 Identify farm animals in Nigeria and their products	Guide the trainee to identify.	

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	Poultry - Meat Eggs Pig - Meat					
7	2.3 Identify the common wildlife animals in Nigeria and their effect on vegetation.	Describe the animals to the trainee.		2.3 Locate wild animals and their effects on the vegetation in the forest.	Take the trainee on excursion to locate the animals and the effects on vegetation.	Buses, camping materials.
	2.4 Identify common wild life animals in Nigeria with the type of vegetation zone.	Describe the animals to the trainee with the vegetation zone.		2.4 Locate wild animals in the different vegetation zones.	Take the trainee to the vegetation zones to locate the animals.	
General Objective: 3.0 Understand the meaning and scope of forestry						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
8	3.1 Define Forestry 3.2 Explain the scope of forestry to include: Direct benefits: wild life, timber, Firewood, Pharmaceutical plants and drugs, tannins, gums, ropes, food Indirect: Watershed management, erosion control, amenity forestry Forest regeneration and management	Explain to the trainee the types of benefits.	Charts			
9	3.3 Explain the following :			Carry out nursery	Explain to the	Nursery , tools and

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	<ul style="list-style-type: none"> - Nursery technology - Plantation establishment - Silvicultural systems - Forest management - Forest utilization 			operations in the nursery.	trainee the procedures.	implements.
	3.4 Identify major indigenous and exotic tree species.	Describe the major indigenous and exotic tree species		Identify and draw the major indigenous and exotic tree species	Carry out an excursion visit to the field	
10	3.5 Outline the structure and organization of forest services in Nigeria.					
General Objective: 4.0 Understand the scope of fisheries.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
11	4.1 Describe the status of fisheries resources production in Nigeria.	Explain to the trainee the development of fisheries and its economic importance.	Charts			
	4.2 Describe physical, chemical and biological properties of aquatic environment.					
	4.3 Explain the importance of fish in human nutrition.					
12	4.4 Define the following: rivers, flood, plains, lake basins, lagoons etc	Explain to the trainee the fishing procedures.		4.4 Store and preserve the quality of fish in the following methods: traditional such as drying., Refrigeration - such as freezing	Guide the student to perform the activities.	Nets, fish dryers Refrigerators etc

Programme: National Vocational Certificate In Agriculture,

Module: VAE 112 Vegetable Gardening

Duration: 50 Hours (One hour theory, four hours Practical)

Unit: 3.0

Goals: This module is designed to provide the trainee with the basic knowledge and skill in vegetable gardening.

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

- 1 Understand the botany of different types of vegetables such as Okro, tomato, spinach, pepper, lettuce, carrot, etc.
- 2 Understand the cultivation practice of vegetables.
- 3 Understand the maintenance of different type of vegetables
- 4 Know the harvesting methods of vegetables.
- 5 Know the marketing strategy of vegetables.
- 6 Understand the nutritional values of vegetables

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	Course: Vegetable Gardening	Course Code: VAE 112		Credit Hours: 3 hours/week		
				Theoretical: 1 hours/week		
	Year:	Pre-requisite:		Practical: 4 hours /week		
	Theoretical Content	Practical Content				
	General Objective : Know the botany of vegetables of economic importance in Nigeria and their establishment					
Week	Specific Learning Outcomes	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Identify vegetables of economic importance in Nigeria. 1.2 Describe the establishment of a vegetable garden.	- Explain the different vegetables of economic Importance in Nigeria. - Explain the establishment process of a vegetable garden bearing in mind the following: - Soil type - Water availability - Climate	Charts	Identify and draw vegetables of economic importance in Nigeria and their varieties. Identify and establish a vegetable garden bearing in mind all the factors mentioned above.	Show the trainee the vegetables. Guide the trainee to locate the site.	

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		<ul style="list-style-type: none"> - Topography - Accessibility - Disease and Pest - Market 				
	General Objective 2.0: Understand the cultivation practice of vegetables					
	2.1 Describe the cultural practices involved in vegetable production.	<ul style="list-style-type: none"> - Explain the cultural practices such as planning, land preparation, weeding watering etc. 		Prepare a vegetables garden and carry out all the cultural operations.	Guide the trainee to carry out the task.	Farm implements such as hand tools, hoes, trowel, rakes watering cans etc
	General Objective 3.0: Understand the maintenance practices of vegetables					
3	<p>3.1 Describe the growth requirements of vegetables of economic importance.</p> <p>3.2 Describe the symptoms of mineral deficiencies, disease and pests associated with vegetables.</p>	<ul style="list-style-type: none"> - Explain the growth requirements to the trainee, such as, nutrient minerals. - Explain the 		<p>Apply mineral nutrients to vegetable in the garden in the form of manure, fertilizer etc.</p> <p>Identify the symptoms of mineral deficiencies disease and pest of vegetable in the garden.</p>	<p>Guide the trainee to apply the nutrient.</p> <p>Guide the</p>	<p>Farm Yard Manure Fertilizers Pesticides Fungicides</p> <p>Pesticid</p>

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		symptoms to the trainee.			trainee to carry out the task.	es
	General Objective 4.0: Know the harvesting methods of vegetables					
4	4.1 Describe the harvesting Procedure of vegetables. 4.2 Describe the post harvest handling of vegetables.	- Explain the procedure to the trainee. - Explain the procedure to the trainee such as packaging ,transportation.		Carry out harvesting of vegetables in the garden. Carry out the packaging and transport of vegetable to the house or market.	Guide the trainee to carry out the task. Guide the trainee to carry out the task.	Cutting knife. Baskets cartons sacks bicycles motorcycles.
	General Objective 5.0: Understand the marketing strategy of vegetables					
5	5.1 Describe the marketing principles of vegetables. 5.2 Describe the nutritional value of vegetables.	- Explain the procedures to the trainee. - Explain the nutritional values of various Vegetables.	Charts	Carryout the marketing of vegetables in the market.	Guide the trainee to carry out the marketing.	

PROGRAMME: National Vocational Certificate In Agriculture

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MODULE: VAE113 Pasture and Forage Production

DURATION: 50 hours (1 hour theory, 4 hours practical)

UNIT: 3.0

GOALS: This module is designed to provide the trainee with the basic knowledge and skill in Pasture and Forage Production..

GENERAL OBJECTIVES:

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

1. Know the importance of Pasture in Livestock Production
2. Know forage and Pasture establishment.
3. Know Pasture and forage conservation and storage.
4. Understand fodder bank.

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE		
COURSE: PASTURE AND FORAGE PRODUCTION.	COURSE CODE: VAE 113	CONTACT HOURS: 50

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GOAL: This module is designed to enable the trainee to acquire the knowledge and skill in Pasture and forage Production.						
COURSE SPECIFICATION: Theoretical Contents: 1 hour				Practical Contents: 4 hours		
1.0	General Objective: Know the importance of Pasture in Livestock Production.			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1 2-3	1.1 Explain the terms Pasture, forage, hay Silage, fodder bank, etc. 1.2 Explain the role of Pasture and forage crops in livestock development.	1.1 Discuss the terms.		Identify pasture and forage plants and classify them according to - Botanical characteristics - Longevity - Nutrient composition and prepare a pasture Album.	Guide the trainee to carry out the task.	
2.0	General Objective Know Pasture and forage establishment.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
4-5 6-7	2.1 Define agro ecological zones. 2.2 Relate the ecological zones to livestock distribution in Nigeria. 2.3 Describe the establishment of pasture and forage farm.	Explain the terms and relate it to the livestock distribution. Explain the process.		Draw a map of Nigeria indicating the agro ecological zones Select land and prepare it for establishing a pasture farm sow /pasture seeds on the land by broad casting, drilling, etc. Harvest pasture	Guide the trainee to perform the task.	Planting materials Harvesting machines Cutlasses.

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				crops using the correct equipment.		
3.0	General Objective Know Pasture Conservation and Storage.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
8-9	3.1 Define forage conservation and it's principles.	Explain the term and the process.		Identify the different types of silage and hay.		
10	3.1 List the uses of conservation in livestock production.	Explain the processes of use e.g. - dvring scarcity - bedding			Guide the trainee.	Charts Diagrams
	3.2 Describe the construction of a silo.	Explain the processes		Construct a silo.	Demonstrate the processes and guide the trainee.	
	3.3 Describe the processes of hay and silage making.			Make different type of hay and silage.		
4.0	General Objective Understand Fodder bank.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
11	4.1 Define fodder bank.	Explain fodder bank to the trainee and its importance in livestock production.				Fencing materials Seeds
9	4.2 Describe the establishment of a fodder bank.	Explain the process to the trainee.		Establish a fodder bank.	Guide the trainee to establish a fodder bank.	

PROGRAMME: National Vocational Certificate In Agriculture

MODULE: VAE 114, Micro Livestock Production (Rabbit and Cane Rat Production)

NVC in Agriculture (Draft)

DURATION: 50 hours (1 hour theory, 4 hours practical)

UNITS: 3.0

GOALS: This module is designed to provide the trainee with the basic knowledge and skill on Rabbit and Cane Rat Production.

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

- 1.0 Know the important breeds of rabbit and cane rat.
- 2.0 Understand the breeding and improvement system in rabbit and cane rat production.
- 3.0 Know the housing need of rabbit and cane rat.
- 4.0 Know the nutritional requirement of rabbit and cane rat.
- 5.0 Understand the diseases and problems of rabbit and cane rat and their prevention and control.

PROGRAMME: National Vocational Certificate In Agriculture		
COURSE: Micro livestock production (Rabbit and Cane rat	COURSE CODE: VAE 114	CONTACT HOURS: 50

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Production)						
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in Rabbit and Cane rat Production.						
COURSE SPECIFICATION: Theoretical Contents: 1 hour			Practical Contents: 4 hours			
General Objective: 1.0: Know the important breeds of rabbit and cane rat.			General Objective:			
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-2	<p>1.1 Identify the various breeds of rabbit and cane rat.</p> <p>1.2 Describe the various characteristics of the breeds above.</p> <p>1.3 Describe the distribution and adaptation of rabbit and cane rat in Nigeria.</p> <p>1.4 State the importance of rabbit and cane rat meat to the meat market.</p>	<p>Explain the various breeds of rabbits and cane rat and their adaptation.</p> <p>Discuss the distribution and adaptation.</p> <p>Discuss the importance with the trainee.</p>	Charts	Identify, draw and label various breeds of rabbits and cane rat indicating their adaptation.		<p>Rabbits</p> <p>Charts</p> <p>Cane rats</p>
General Objective: 2.0: Understand the breeding and improvement system in rabbit production						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources

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3-4	<p>2.1 Explain the conditions considered in the selection of rabbit and cane rat.</p> <p>2.2 Describe the desirable characteristics of male and female sought for when breeding rabbits and cane rat.</p> <p>2.3 Explain the effect of pure breeding, in breeding and cross breeding on rabbit and cane rat development.</p>	<p>Describe the process to the trainee.</p> <p>Explain the processes to the trainee.</p> <p>Describe the effect to trainee.</p>		<p>Carry out pure breeding in breeding and cross breeding of rabbit and cane rat and observe their effect.</p>	<p>Guide the trainee to perform the exercise.</p>	<p>Various breeds of rabbits cane rat.</p>
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General Objective: 3.0: Know the housing need of rabbit and cane rat.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
5-6	<p>3.1 Describe the design of rabbit and cane rat house, relating it to the climatic condition and space requirement.</p> <p>3.2 List the equipment needed for rearing rabbits and cane rat.</p> <p>3.3 List factors influencing the location of the farm.</p>	<p>Explain the process to the trainee</p> <p>Explain the equipment.</p> <p>Describe the factors.</p>		<p>Construct a rabbit and cane rat house taking into account the climatic condition, space requirement.</p> <p>Identify and draw the equipment.</p>	<p>Guide the trainee to carryout the construction.</p> <p>Guide the trainee to identify.</p>	<p>Hitches Cages Nest Boxes Charts</p>

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COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
	General Objective: 4.0: Know the nutrition requirement of rabbit and cane rat.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
8-9	<p>4.1 Describe the digestive system of rabbits and cane rat.</p> <p>4.2 List various types of graded and legumes used for feeding rabbits and cane rat.</p> <p>4.3 State the nutrients requirement of rabbit and cane rat.</p> <p>4.4 State the daily feed meal allowance and water requirement of rabbits and cane rat.</p> <p>4.5 Identify the symptoms of nutritional diseases of rabbits and cane rat.</p>	<p>Explain the digestive system of rabbits and cane rat</p> <p>Describe the grasses and legumes consumed by rabbits and cane rat.</p> <p>Discuss the processes with the trainee.</p> <p>Explain the symptoms to the trainee.</p>	<p>Models</p> <p>Samples of grasses</p>	<p>Dissect a rabbit and draw the digestive system and label.</p> <p>Identify the grasses and legumes</p> <p>Measure the daily meal allowance and water requirement of rabbits cane rat.</p> <p>Identify the symptoms from the field.</p>	<p>Guide the trainee to carryout the tasks.</p> <p>Describe the process.</p>	<p>Live rabbit.</p> <p>Samples of grasses and legumes.</p>
	General Objective: 5.0: Understand the diseases and problems of rabbits and cane rat and their control.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
12	<p>5.1 List the common diseases in rabbits and cane rat.</p> <p>5.2 Explain the prevention measures of diseases of rabbits and cane rats</p> <p>5.3 Identify the symptoms and</p>	<p>Explain the diseases.</p> <p>Explain the prevention measures</p> <p>Describe the</p>	<p>Charts, Vaccines Syringes</p>	<p>Carry out vaccination exercise</p> <p>Disinfects all houses and equipments</p>	<p>Guide the trainees to vaccinate and disinfect</p>	<p>Charts Vaccines Syringes Disinfectants</p>

NVC in Agriculture (Draft)

	control of common diseases in rabbits and cane rat.	symptoms to the trainee.				
5.4	Identify sign of ill health in rabbits and cane rat	Describe the sign to the trainee.	Charts	Identify disease infected rabbit and cane rat in the farm and treat it.	Guide the trainee to carry out the task.	Dissected Rabbits and Cane rat diagrams

NVC in Agriculture (Draft)

Programme National Vocational Certificate In Agriculture

Module: VAE 121 Fish Farming

Duration: 40 Hours (1Hour Lecture and 3 hours practical)

Unit: 3.0

Goals: This module is designed to provide the trainee with the basic knowledge and skill in Fish Farming.

General Objectives:

1. Outline the development of fish farming in Nigeria.
2. Understand the establishment of fish farm.
3. Understand the construction procedure of a pond.
4. Understand the management and feed formulation
5. Know the harvesting process of fish in a pond.
6. Know fish preservation and processing.

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: Fish Farming			COURSE CODE: VAE 121		CONTACT HOURS: 40 hrs	
GOAL: This module is designed to provide the basic knowledge and skill in fish farming.						
COURSE SPECIFICATION: Theoretical Contents: 1 HOUR				Practical Contents: 3 HOURS		
General Objective: 1.0 Outline the development of fish farming in Nigeria.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	1.1 Explain the history of fish farming in Nigeria.	<ul style="list-style-type: none"> Discuss the history of fish farming, it's importance, the producing area. 	<ul style="list-style-type: none"> Map of Nigeria showing the major fishing area. 			
	1.2 Describe the importance of fish in human nutrition.	<ul style="list-style-type: none"> Explain the importance. 				
	1.3 Explain the major fishing areas in Nigeria.	<ul style="list-style-type: none"> Explain the areas. 		1.3 Identify the major fishing areas in Nigeria from the map of Nigeria.	<ul style="list-style-type: none"> Instruct the trainee to do the task. 	<ul style="list-style-type: none"> Map of Nigeria
2	1.4 Explain the various sections in fisheries development small scale, exploration, antesal industrial etc.	<ul style="list-style-type: none"> Discuss the role of various economic sectors in fisheries development. 				
General Objective: 2.0 Know the establishment of a fish farm.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
3	2.1 Describe the pre-requisite for	<ul style="list-style-type: none"> Explain the pre-requisites. 	<ul style="list-style-type: none"> 		<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

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	establishing a fish farm.					
	2.2 Define ponds and their classification according to: - volume of water supply. - species of fish stocked - usage - source of water supply	<ul style="list-style-type: none"> • Explain ponds and their classification to the trainee. 		2.3 Identify various ponds and classify them.	<ul style="list-style-type: none"> • Guide the trainee. 	<ul style="list-style-type: none"> • Ponds
	2.3 Describe the following cultural requirement: - soil type - quantity of water necessary. - quality of water Necessary	<ul style="list-style-type: none"> • Explain the cultural requirements. 				
General Objective: 3.0 Understand the construction procedure of a pond.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
4-5	3.1 Describe pond survey.	<ul style="list-style-type: none"> • Explain the process of pond survey. 		3.1 Carry out a pond survey	<ul style="list-style-type: none"> • Guide the trainee to carry out the survey. 	<ul style="list-style-type: none"> • Survey tools and equipments.
	3.2 Describe the following operations in pond construction: - Excavation - Laying out the pond - construction of the draining installation (sluice gate/muck)	<ul style="list-style-type: none"> • Explain the operations. 	<ul style="list-style-type: none"> • 	3.2 Carry out the construction of a pond.		
	3.3 Describe the importance of liming and fertilization of ponds.	<ul style="list-style-type: none"> • Explain the importance. 		3.3 Carry out lime and fertilize a pond and measure the effect.		

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6-7	3.4 Describe the effects and importance of: - PH - temperature - oxygen - carbon dioxide on fish	Explain the effect and importance of the factors.		3.4 Measure the PH, temperature, oxygen, carbon dioxide of a pond and record their effect on fish development.		
	3.5 Describe the measurement procedure of the above factors.	Explain the procedure				
	3.6 Describe the different types of fish feeds and fish stuff.	Explain the terms.		Prepare a fish feed.	Guide the trainee to prepare.	Fish feeds.
	3.7 Describe the technique of formulating fish feeds.	Explain the techniques				
8	3.8 Describe the technique for fish breeding.	Explain the techniques.		3.8 Carry out fish breeding	Guide the trainee to carry out the activities.	
	3.9 Describe the production of fingerlings by Inter planting fish male sperm with female eggs.	<ul style="list-style-type: none"> Explain the techniques. 		3.9 Produce fingerlings by the describe process.	<ul style="list-style-type: none"> Guide the trainee to produce. 	
	3.10 Describe the management of fingerlings.	<ul style="list-style-type: none"> Explain the management procedure. 		3.10 Manage the fingerlings produced.	<ul style="list-style-type: none"> Guide the trainee to manage. 	
General Objective: 4.0 Know the harvesting process of fish in ponds.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
9	4.1 Describe fishing gears used in Nigeria.	<ul style="list-style-type: none"> Explain the term and the processes of harvesting fish. 	Fishing gears Nets	4.1 Identify common fishing gears used in Nigeria.	<ul style="list-style-type: none"> Guide the trainee to carry out the harvesting 	Fishing gears Nets

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	4.2 Describe the method of catching of fish by draining of water and by using various nets, dyke, drum etc.	<ul style="list-style-type: none"> Explain the various methods. 		4.2 Drain and harvest fish from the farm. Harvest fish by using various nets dyke and drum.	<ul style="list-style-type: none"> Demonstrate the various methods to the trainee. 	
	4.3 Describe the fishing craft used in fishing such as raft, canoes, dinghy etc.	<ul style="list-style-type: none"> Explain the crafts. 		4.3 Identify the fishing craft and the materials used in constructing them.	<ul style="list-style-type: none"> Guide the trainee to identify. 	<ul style="list-style-type: none"> Crafts
	4.4 Describe the materials used for boat construction – wood, steel, glass, fibre etc.					
General Objective: 5.0 Know fish preservation and distribution methods.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
11	5.1 Explain the terms fresh water, freezing, chilling, smoking, salting, canning.	<ul style="list-style-type: none"> Discuss the terms 	<ul style="list-style-type: none"> 	5.1 Identify the terms and carry out the processes.	<ul style="list-style-type: none"> Guide the trainee. 	<ul style="list-style-type: none">
12	5.2 Explain the role of packing and storage in fisheries.	<ul style="list-style-type: none"> Explain the role of packaging and storage. 	<ul style="list-style-type: none"> 	5.2 Carry out packaging and storage of fish in kiln, cold room, refrigerator etc.	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Kiln Cold room Refrigerator
	5.3 Describe the distribution and marketing channels of fish in Nigeria.	<ul style="list-style-type: none"> Discuss the channels. 	<ul style="list-style-type: none"> 		<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

PROGRAMME: National Vocational Certificate In Agriculture.

MODULE: VAE 122, Feed Processing and Formulation

DURATION: 40 Hours (1 Hours theory, 3 Hours Practical

UNIT: 3 .0

GOALS: This module is designed to provide the trainee with the basic knowledge and skills in feed processing and formulation.

GENERAL OBJECTIVES:

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

1. Know the various classes of Livestock feeds
2. Know the methods of livestock feeds processing
3. Know feeds Storage
4. Know the formulation of balanced rations
5. Know the feed quality as a measure of it's nutritive value.

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.						
COURSE: FEEDS PROCESSING		COURSE CODE: VAE 122		CONTACT HOURS: 40 HOURS		
GOAL: This module is designed to provide the trainee with the skill and knowledge in feed processing.						
COURSE SPECIFICATION: Theoretical Contents: 1 HOUR				Practical Contents: 3 HOURS		
1.0	General Objective: Know the various classes of livestock feeds			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-2	1.1 Describe the various classes of feeds according to their chemical characteristics - water - Carbohydrate - Protein - Fats and oil - Minerals - Vitamins State their biological Functions.	- Explain the process to the trainee.	Feeding standard tables	Identify the various nutrients components of feeds in the laboratory.	Show the process to the trainee.	Feeding standard tables
	1.2 Describe the various classes of feeds according to their physical characteristics.	Explain roughages concentrate supplements etc	Samples of feed classes	Identify the feed samples and classify them according to their physical characteristics	Guide the trainees in identification	Feeds samples
3	1.3 Describe the chemical composition of the various classes of livestock feeds	Explain energy feeds, protein concentrates etc		Analyse the chemical composition of the various classes of livestock feeds	Guide the trainees to describe the samples	Feeds samples
	1.4 Describe the biological composition of the feeds.	Explain the composition.				

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	1.5 List the nutritive composition of the various classes of feeds, such as roughages, energy feeds, protein supplement and mineral supplements	Explain dry matter, crude protein energy etc		Identify and classify items in 1..5	Explain classification techniques	Samples of feeds
2.0	General Objective 2.0 Know the methods of livestock feed processing.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Describe the various methods used in processing and preparing livestock feeds.	Explain the procedure to trainee.		Prepare feeds for poultry rabbits goats, pigs, etc.	Describe the procedure.	
	2.2 Explain the effects of each method on the feeds and animals	Describe the effects.				
3.0	General Objective 3.0 Know feeds storage.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	3.1 Define food deterioration.	Explain the term to the trainee		Preserve and store livestock feeds and measure their effectiveness on its nutritional values.	Guide the trainee to carry out the task.	Feeds
	3.2 Describe the various methods of preserving/storing livestock feeds					
	3.3 Describe the factors influencing the effectiveness of feed preservation/storage on the nutritional value of feeds and components.					
4.0	General Objective 4.0 Know the formulation of balance rations.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	4.1 Explain ration formulations	Discuss the terms with the trainee.				
	4.2 Define balance ration					
	4.3 Describe various methods of ration formulation					

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	4.4 Formulate ration using the followings: <ul style="list-style-type: none"> - Pearson Square - Algebraic method - Trial and error method 			Prepare feeds using the methods	Guide the trainee.	
General Objective 5.0 Know feeds quality as a measure of its nutritive value.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	5.1 Define palatability and digestibility 5.2 Describe the methods of determining digestibility 5.3 Explain factors affecting digestibility.	Explain the process to the trainee.		Carryout practical calculation of digestibility.	Guide the trainees to carryout the calculation.	

NVC in Agriculture (Draft)

Programmes: National Vocational Certificate In Agriculture.

Module: VAE 123 Animal Traction

Duration: 40 Hours (1 Hour Theory, 3 Hours Practical)

Unit: 3.0

Goals: This module is designed to provide the trainee with the basic knowledge and skill oin Animal Traction.

General Objectives:

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

1. Understand the meaning and historical background of Animal Traction.
2. Understand the animals used in animal traction.
3. Know the basic techniques of animal traction.
4. Understand the equipment used in animal traction.
5. Know the nutritional and health requirement of the animals used in animal traction.

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.						
COURSE: Animal Traction			COURSE CODE: VAE 123		CONTACT HOURS: 40 hrs	
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in animal traction.						
COURSE SPECIFICATION: Theoretical Contents: 1 HOUR				Practical Contents: 3 HOURS		
	General Objective: Understand the meaning and historical background of animal traction.			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	1.1 Define animal traction	<ul style="list-style-type: none"> Describe animal traction to the trainee, its advantages and constraints to agriculture. 	Charts			Charts
	1.2 Explain the historical background of animal traction.	Describe the historical background of animal traction				
	1.3 List the advantages and constraints of animal traction.	Explain the advantages and constraints of animal traction				
General Objective: 2.0 Understand the animals used in animal traction.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
2	2.1 Describe the animals used in animal traction activity such as cattle and it's advantages and disadvantages.	<ul style="list-style-type: none"> List out the animals used in traction activity, their advantages and disadvantages. 	<ul style="list-style-type: none"> Charts 	2.1 Identify the various animals in the field.	<ul style="list-style-type: none"> Guide the trainee to identify the animals. 	<ul style="list-style-type: none"> Cattle Donkeys
	2.2 Describe the other animals used in animal traction such as, camels, horses.	List out the animals.		Identify the animals in the field	Guide the trainee to identify the animals	Horses Camels

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	2.3 State the advantages and disadvantages of these animals.					
General Objective: 3.0 Know the basic techniques of animal traction:						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
3	3.1 Describe the restraining of work bulls.	<ul style="list-style-type: none"> Explain the restraining procedure to the trainee. 				
4	3.2 Describe the materials required for restraining work bulls and their insertions.	<ul style="list-style-type: none"> List the materials for restraining and their insertions process. 	Yokes Nose ring Nose rope	3.2 Identify the restraining Materials. Carry out the insertion of the material in the animals.	<ul style="list-style-type: none"> Guide the trainee to carry out the task. 	<ul style="list-style-type: none"> Restraining materials Drought animals
	3.3 Explain insertion of nose-ring and nose-rope.	<ul style="list-style-type: none"> Describe the process to the trainee. 		3.3 Carry out the insertion of nose-ring and nose-rope to the animals.	<ul style="list-style-type: none"> Guide the trainee to carry out the task. 	<ul style="list-style-type: none"> Drought animals - ring - rope
5	3.4 Define yokes and harnesses.	<ul style="list-style-type: none"> Explain the meaning of yoke. 	<ul style="list-style-type: none"> Charts 			Yokes and harness samples
	3.5 List out the types of yokes such as, horn/head yokes withers/shoulders yoke.	<ul style="list-style-type: none"> Describe the different types of yoke and their lengths. 	<ul style="list-style-type: none"> Charts 	3.5 Identify the different types of yokes and draw.	<ul style="list-style-type: none"> Guide the trainee to do the task. 	<ul style="list-style-type: none"> Yokes
6-9	3.6 Describe drought animals training and words of command.	<ul style="list-style-type: none"> Explain the training procedures of drought animals such as - Age at training - Training materials - Preparing animal for training - Training process 	<ul style="list-style-type: none"> Charts 	3.6 Carry out training of drought animals for traction activities.	<ul style="list-style-type: none"> Guide the trainee to achieve the task. 	<ul style="list-style-type: none"> Drought animals.

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		<ul style="list-style-type: none"> - Duration of training. - words of command. - Training of operation. - Adequate care of animal. 				
General Objective: 4.0 Understand the equipment used in animal traction.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
10	4.1 Describe drought animal power development and equipment.	<ul style="list-style-type: none"> • Explain drought animal power development and equipment and the characteristics of a good equipment. 	<ul style="list-style-type: none"> • Charts 			
	4.2 Define the characteristics of a good animal drawn equipment such as, plough, harrow, ridge, seed planters, weeder, groundnut lifters, cants, land levelers.	<ul style="list-style-type: none"> • Explain the equipment. 	<ul style="list-style-type: none"> • 	4.2 Identify the animal drawn equipment such as plough, harrows ridges, seed planters, weeder, ground lifters, cants, land levelers etc and make drawing of the equipment.	<ul style="list-style-type: none"> • 	Animal drawn, farm equipment
	4.3 Describe the parts, operation, adjustments, operation method and the quality of operations of the equipment listed in 4.2 above.	<ul style="list-style-type: none"> • Explain the processes to the trainee. 	<ul style="list-style-type: none"> • 	4.3 Carry out drought operation with the equipment taking into cognizance the adjustment, operation methods and the quality of operation.	Guide the trainee to perform the task	Animal drawn, Farm equipment e.g. carts harness etc

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General Objective: 5.0 Know the nutritional and health requirement of draught animals.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
12	5.1 Describe the nutritional management of draught animals.	Explain the nutritional requirement, feed intake and digestibility, provision of salt lick and housing of draught animals.	Salt lick, Feed samples	5.1 Feed draught animals with different categories of feeds salt lick etc and observe their growth and development.	Instruct the trainee to carry out the assignment.	Draught animal feeds, salt lick.
	5.2 List the common disease of draught animals and their control measures.	Explain the diseases and their control measures.	Charts tables	5.2 Treat a sick draught animal of various diseases.	Guide the trainee to treat the draught animal.	Sick animal drugs vaccines syringes.

Programme: National Vocational Certificate In Agriculture.

Module: VAE 124, Swine Production

Duration: 30 hours (1 hour Lecture, 2 hours practical)

Unit: 4

Goals: This module is intended to acquaint the trainees with the skills in rearing swine

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

1. Know livestock population and associated factors of production in Nigeria
2. Know the difference between ruminant and non-ruminant
3. Know the housing and construction
4. Know the methods of swine productions
5. Understand selection and selection methods involved in swine productions
6. Understand the nutrition of swine
7. Understand management practices in swine farming
8. Understand the various production records kept in swine farms
9. Know the procedures involved in swine processing

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.						
COURSE: SWINE PRODUCTION		COURSE CODE: VAE 124		CONTACT HOURS: 30 Hours (1 hr lecture, 2 hrs practical)		
GOAL: This module is intended to acquaint the trainees with skills in rearing non-ruminant animals (Pigs).						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0 Know livestock population and associated factors of production in Nigeria.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	<p>1.1 Illustrate the past, present and future development of the swine industry in Nigeria.</p> <p>1.2 Explain factors that hinder the production of swine in Nigeria.</p> <p>1.3 Identify the major producing areas of swine in Nigeria</p> <p>1.4 Explain the factors that should be considered when establishing a swine farm.</p>	<p>List factors of Swine production In some areas in Nigeria</p> <p>Draw map or graph showing distribution of swine population in Nigeria.</p> <p>Describe the factors.</p>	Map of Nigeria	Identify the major producing areas.	Guide the trainee to identify the areas	Map of Nigeria

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General Objective: 2.0 Know the difference between ruminants and non-ruminants.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Define ruminants and non-ruminants 2.2 Define the major physiological differences between the ruminants and non-ruminants	Explain the characteristics of ruminants and non-ruminants	Charts	Identify ruminants and non-ruminants Draw a named ruminant and a non-ruminant	Guide the trainees to identify the common ruminants and non-ruminants	Charts Drawings Live animals
General Objective: 3.0 Know swine housing and construction.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
2	3.1 Describe the different kinds of housing for the rearing of pigs. 3.2 State the stocking densities for the different classes of pigs.	Explain types of houses for pigs Explain the need for housing Demonstrate how to calculate stocking density	Swine pens	(1) Design and construct a model swine farm	Guide the trainees to design and construct a model pen	Building materials
General Objective 4.0 Know the methods of swine production						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
3-6	4.1 Describe with local examples the following systems of swine	Explain these systems and the differences,		(1) Prepare a three year breeding programme For swine.	Guide the trainees to prepare a breeding	Charts

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	<p>production :</p> <ul style="list-style-type: none"> (i) intensive (ii) extensive (iii) semi-intensive (iv) subsistence <p>4.2 Explain the steps to be taken when establishing a swine farm enterprise.</p> <p>4.3 Describe swine breeding under the following:</p> <ul style="list-style-type: none"> (i) mating, methods e.g. artificial insemination (ii) mating ratio (iii) heat period (iv) signs of heat (v) gestation period (vi) Parturition (vii) Signs of parturition (viii) Breeding efficiency (ix) Wearing period <p>4.4 Describe the following breeding systems:-</p> <ul style="list-style-type: none"> (i) in breeding (ii) cross breeding (iii) close breeding (iv) out crossing (v) back crossing (vi) up-grading (vii) model breeding programme 	<p>advantages and disadvantages</p> <p>List the steps in establishing a swine farm</p> <p>Explain how a breeding programme is prepared</p> <p>Explain the methods of the systems in 4.4</p>	<p>Use charts or tables</p> <p>Breeding charts</p>	<p>(2) Compare crossbred And pure bred pigs.</p> <p>Identify animals on heat, signs of pregnancy, and wearing age of piglets</p> <p>Carry out in breeding cross breeding programmes</p>	<p>programme</p> <p>Guide the trainees to detect heat signs, Carry out natural mating, detect signs of parturition and wear piglets</p> <p>Guide the trainees to carry out in breeding and cross breeding</p>	<p>Slide projective video tapes of animals on heat etc</p> <p>Breeding boars, and sows, Slide projective video clips</p>
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	4.5 State the relative advantages and disadvantages of the systems of breeding in 4.4 above.	Explain the advantages and disadvantages in 4.4				
General Objective 5.0 Understand selection and selection methods involved in swine production						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
7-8	<p>5.1 Define selection and Explain the reasons for selection of animals</p> <p>5.2 Explain the various selection methods e.g.</p> <p>(i) individual selection method</p> <p>(ii) pedigree selection</p> <p>(iii) progeny test selection</p> <p>(iv) independent culling level selection</p> <p>5.3 Explain why a combination of individual merit, pedigree and progeny test is the best selection Method.</p> <p>5.4 Describe the following economic and non-economic traits or characteristics as basis for selection::</p>	<p>Explain basis for selection</p> <p>Explain the criteria for using the methods in 5.2 and the constraints</p> <p>Explain the merits of each of the methods</p> <p>Emphasize the importance of these traits to the farmer</p>	<p>Pedigree records, progeny record</p>	<p>Carry out selection in swine</p> <p>Carry out selection of a group of swine for the traits mentioned in 5.4 Above.</p>	<p>Guide the trainee in carrying out selection</p> <p>Guide the trainee to carry out selection of a group of swine</p>	<p>Live pigs</p> <p>Live pigs</p>

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	(i) prolificacy (ii) birth weight (iii) wearing weight (iv) finish (v) feed conversion ratio (vi) pre and post wearing mortality.					
General Objective 6.0 Understand the nutrition of swine						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
9-10	6.1 Describe the digestive system of swine as a typical monogastric with simple digestive system	Explain functions of the digestive system.	Charts, Diagrams	(4) Dissect and display the digestive system of monogastrics	Guide the trainee to dissect and display the digestive system of monogastrics	Animals, dissecting kit, charts slides etc
	6.2 List the various ingredients used in formulating swine ration	Classify feed ingredients in swine nutrition	Samples of feedstuff			
	6.3 State the nutritional composition of the ingredients mentioned in 6.2 above.	Describe feed formulation		(5) Formulate swine rations depending on the production purposes	Demonstrate feed formulation to the trainee	Samples of feedstuffs
	6.4 Describe nutritional diseases of swine according to their causative agents e.g. osteomalacia	Explain economic importance of disease conditions	Charts	e.g. piglet, wearing fattening and breeding		

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	6.5 Describe the prevention and control measures for the various swine diseases and parasites.	Explain the preventive and control measures	Disease prevention and control programmes (table)	Carry out vaccination programme	Demonstrate vaccination of pigs, treat diseased pigs	Vaccines Syringes Drugs Disinfectants etc Disease prevention and control programme charts
General Objective 7.0 Understand some management practices in swine farming.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
11	7.1 Describe the following management operations: (i) castration (ii) deworming (iii) teeth cutting (iv) identification	Explain importance of management in swine farms	Charts Film slides	(3) Carry out the management operations in 7.1	Demonstrate the operation in 7.1	Piglets Boars Castrators, Cutting pliers, Knother and helminthes
General Objective 8.0 Understand the various production records kept in swine farms						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	8.1 Describe the various records kept on the farm i. Production records ii. Accounting records	Explain the importance of farm records	Record charts, tables, etc	(7) Design various types of records used in a swine farm.	Guide the trainees to carry out record sheets	Sample Record sheets
General Objective 9.0 Know the procedures involved in swine processing						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
12	9.1 Determine the killing out percentage of swine.	Outline swine processing procedures		(8) Slaughter, dress, cut and package swine	Demonstrate slaughter and dressing of pigs	Live pigs Slaughtering and dressing

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	9.2 Describe methods of slaughtering animals.	Explain the different methods of immobilization and slaughter		(9) Process swine meat into pork and bacon.		kits
	9.3 Compare the methods of slaughtering	Explain the advantages and disadvantages of 9.3		(10) Carry out immobilization and slaughter of pigs	Demonstrate immobilization and slaughter methods to the trainee	Live pigs Immobilizations slaughter kit
	9.4 Identify the various whole sale and retail carcass cuts of swine.	Explain the various carcass cuts and values eg ham		(11) Cut pig carcass into wholesale and retail parts	Demonstrate the cutting to the trainee	Cutting knife carcass Weighing scale Packaging materials

Programme: National Vocational Certificate In Agriculture.

Module: VAE 125, Agro forestry Practice.

Duration: 40 Hours (1 Hour theory, 3 Hour Practical)

Unit 3.0

Goals: This module is designed to provide the trainee with the basic knowledge and skill in Agro forestry practices.

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

1. Understand the meaning of Agro forestry.
2. Know the importance of agro forestry to agriculture.
3. Know the different agro forestry systems, such as agro- silvicultural, Silvo- pastoral, agro-silvo pastoral, agro-silvo – piscicultural and Silvo-apicultural
4. Know the methods of crops and tree arrangement.

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	Course: Agro forestry	Course Code: VAE 125		Credit Hours: 3 hours/week		
				Theoretical: 1 hour/week		
	Year: 1 Term II	Pre-requisite:		Practical: 3 hours /week		
	Theoretical Content			Practical Content		
	General Objective 1.0: Understand the meaning of agro forestry					
Week	Specific Learning Outcomes	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Define agro forestry.	- Explain the meaning of agro forestry to the trainee.	Charts and pictures			
	1.2 Trace the historical background of agro forestry.	- Discuss the historical background of agro forestry.				
	General Objective 2.0: Know the importance of agro forestry to agriculture					
2	2.1 List the advantages and disadvantages of agro forestry.	- Discuss the advantages and disadvantages with the trainee.				
	General Objective 3.0: Know the different agro forestry systems					
3	3.1 Describe the different agro forestry practices.	- Explain the practices to the trainee.	Sketches	Visit an agro forestry farm and identify the different practices.	Guide the trainee to identify the practices.	Forest farm
	3.2 Describe Agro silvicultural system	- Explain the system to the trainee.	Sketches			
	3.3 Describe Silvo-pastoral system.	- Explain the system to the trainee.	Sketches			Visit an agro forestry farm and identify the different practices
	3.4 Describe agro silvo-pastoral.	- Explain the system to the trainee.				
	3.5 Describe agro-silvo-	- Explain the system to the				

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	pisciculture.	trainee.				
3.6	Explain the principle of tree selection for agro forestry practices.	- Describe the tree species to be used for agro forestry system.	Charts and sketches	Visit an agro forestry farm and identify tree species	Guide the trainees to identify the tree species	Forest farm
3.7	Define multi-purpose tree.	- Describe multi purpose tree to the trainee.		Identify multi purpose tree.	Guide the trainee to identify multi purpose tree.	Forest
3.8	Describe Silvo-apiculture	Explain the concept to the trainee	Sketches	Construct hives	Guide the trainee to construct bee hives	Hives
General Objective: 4,0 Know the methods of crops and tree arrangement						
4.1	Describe the simultaneous method of arrangement - Zone - Scattered - Alley farming	Explain the various methods of arrangement	Charts	Identify the various tree crops arrangement in the field such as: - Zone - Scattered - Alley farming	Guide the trainee to identify the various systems in the field.	
4.2	Describe the sequential method of arrangement	Explain the method to the trainee		Identify the tree-crops sequential system in the field.		
4.3	Describe the relay system of arrangement	Explain the method to the trainee		Identify the tree-crops relay system		

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	4.4 State the importance of each system to crop development	Explain the importance of the systems to crop development		of arrangement in the field.		
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Programme:	National Vocational Certificate In Agriculture.
Module:	Animal Health
Course Code:	VAE 126
Course Duration:	40 hours (1 hour theory, 3 hours practical)
Course Unit:	3.0
Goal:	The module is designed to provide the trainee with the basic knowledge and skill in the practice of animal health.

General Objectives:

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

- 1.0 Understand the principle of animal health practice
- 2.0 Know the risks and hazards in handling sick animal.

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PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.						
COURSE: ANIMAL HEALTH		COURSE CODE: VAE 126		CONTACT HOURS: 40 HOURS		
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in the practice of animal health and hazard.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
1.0	General Objectiv Understand the principec of animal health practice.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-6	1.1 Define the terms, health, disease, parthogenicity, infectivity. 1.2 Explain clinical work ethic 1.3 Explain the causes of disease and their prevention. 1.4 Describe disease predisposing factors. 1.5 Describe disease statistics, incidence, prevalence, morbidity, mortality and cardinal signs of inflammation.	Explain the terms and the process of carrying them out. Explain the terms with descriptions. Explain the causes and prevention of various diseases of animals. Explain predisposing factors. Explain terms in 1.5	Charts Charts and tables	Identify various animal diseases and list their preventions. Identify disease predisposing factors and list them. Display inflamed animals, pictures or charts	Describe the diseases and their preventions. Explain the identification process. Show inflamed animals, pictures or charts to the trainee	Tables Charts Inflamed animals pictures, charts etc

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WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
7-12	1.6 Describe the terms, diagnosis, clinical examination, postmortem examination, laboratory examination.	Explain the term with descriptions.		Carry out diagnosis, clinical examination and post mortem examination of sick and dead animals	Guide the trainee to carryout the operations	Sick animals Dead animals Post marten kit
	1.7 Describe the signs of a healthy animal and a sick animal.	Explain the signs and symptoms of diseases in animals.		Identify a healthy and a sick animal in the farm or field and record.	Guide the trainee to carry out the identification.	Healthy animals sick animals.
	1.8 Explain normal temperature, pulse and respiratory rates.	Describe the terms and the procedure of measuring them.		Stethoscope. Thermometer.	Identify the measuring equipment, draw and label them. Measure the temperature, pulse rate and respiratory rates of an animal using the equipment.	Describe the equipment and the process of using them.

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2.0	General Objective: 2.0 Know the Risk and Hazard in Handling Sick Animal					
	2.1 List the professional hazards or risks in treating sick animals and the measures taken to prevent or avoid danger to human life.	Discuss the risks and hazards with the trainee.	-			
	2.2 Explain sterilization of health equipment and tools.	Describe the sterilization process.		Carry out sterilization of veterinary tools and equipment.	Describe the process.	Autoclaves

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE

MODULE: VAE 127 Workshop Practice

DURATION: 40 HOURS (1 hour Lecture, 3 hours practical)

UNIT: 3.0

GOAL: This module is designed to provide the trainee with a good knowledge of workshop tools and materials used in construction and maintenance of Agricultural equipment to enable him carry out repairs of Agricultural equipment and implements.

GENERAL OBJECTIVES:

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

- 1.0 Appreciate the importance of safety while at work.
- 2.0 Understand the properties of different types of metals and non – metals, their uses advantages and limitations.
- 3.0 Know all tools used for the repairs of agricultural equipment.
- 4.0 Know different types of sheet metals and be able to use and take care of all tools used in sheet metal works.
- 5.0 Understand the principles of soldering, brazing, welding and forging of simple implements and be able to carry out these operations.

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PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: WORKSHOP PRACTICE			COURSE CODE: VAE 127		CONTACT HOURS: 40 HOURS	
GOAL: This module is designed to provide the trainee with a good knowledge of workshop tools, and materials used in construction and maintenance of agricultural equipment and implements to enable him carry out repairs of agricultural equipment and implements.						
COURSE SPECIFICATION: Theoretical Contents: 1 HOUR				Practical Contents: 3 HOURS		
General Objective: 1.0 Appreciate the importance of safety while at work.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	1.1 List sources of hazards in the workshops. 1.2 Describe and demonstrate first aid application in case of minor injuries, electric stocks and burns. 1.3 Describe artificial respiration.	Explain hazards. Describe mouth – to – mouth resuscitation	First aid kit			
General Objective: 2.0 Understand the properties of different types of metals and non metals, their uses advantages and limitations.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Explain the properties of all types of metals. 2.2 Explain the properties and Uses of all types of alloys.	Explain the use of thermoplastics and other non-metals as used in agricultural equipment.		Identify metals by sound test appearance, spark test and any other quick test.	Perform annealing of aluminum and uppercase hardening of low carbon steel hardening tempering non-	Different types of metals and alloys

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2-3	2.3 State the advantages and limitations of special steel and other alloys.			Perform cold and hot working operations e.g bending, twisting and straightening. Carry out heat treatment of metals.	metals of carbon steel.	
General Objective: 3.0 Know all tools used for repair of Agricultural Equipment.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	3.1 Describe the use of hand tools for loosening and tightening, making holes, enlarging holes, cutting threads, smoothening surfaces etc	Explain the use of each tool	Tools Charts	Use and maintain common tools life spanners screw driver, drills, reamers, taps and dies, files, saws, chisels and pincers used for typical repair and maintenance work.	Guide the students to use these common tools and identify them.	Common hand tools
	3.2 Describe hand tools for measuring laughs, diameter, (internal and external) degrees, thicknesses etc	Explain the use of each tool	Tools Charts	Identify and take care of measuring Instruments like steel rule, calipers, dividers, square, straight edge, protectors, angle guage, thrcknen guage, wire guage thread guage, drill guage etc.	The trainee should be made to take care of these Instruments.	Measuring tools and instruments
	3.3 Describe power tools for pressing and lifting equipment	Explain the use and importance of power tools in the workshop	Tools Charts	Identify and take care of pullers hydraulic press and difference types of jacking and lifting equipment e.g. cranes, hydraulic jack, hoists and slings.	Guide the trainee to identify lifting equipment	Lifting equipment e.g. cranes hydraulic jacketc
General Objective: 4.0 Identify different types of sheet metal and be able to use and take care of all tools used in sheet metal works.						
	4.1 Describe different types of	Explain the uses of	Different	Identify, use and take care of	Guide the	Metals of

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6-8	sheet metal e.g. galvanized sheet metal, mild steel metal etc	different types of sheet metal listed in 4.1 above.	types of sheet metal	various types of sheet metals. Use and take care of sheet metal tools. Prepare sheet metals for welding soldering, rivetting etc. Construct simple items such as guards and trays from sheet metals	students to use and take care of brass sheet, copper sheet aluminium sheet etc. Guide the trainee in the use of mallet sinps, groves, lappers, swages, hammer riveting tools etc.	different types Sheet metals Sheet metal tools
General Objective: 5.0 Understand the principles of soldering brazing welding and forging of simple implements and carry out these operations.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	5.1 Explain the basic principles of oxy- acetylene including the chemistry of the manufacture of acetylene and oxygen gases	Describe the wielding of metals using oxy-acetylene flames	Acetylene and oxygen cylinder	Reorganize different types of soldering iron. Set up welding equipment including selecting gas pressure and nozzle sizes for welds of different types of metals.	Guide the trainee to use soldering iron and lead	Soldering equipment Welding equipment
	5.2 Explain the difference between AC and DC welding systems and be able to apply them safely.	Differentiate between AC and DC wielding system	AC, DC transferers	Use bronze welding for repair work and build worn parts.	Guide the trainee to identify the welding equipment	Acetylene equipment
	5.3 State the advantages and disadvantages of acetylene welding processes on Agricultural repairs.	Explain the advantages and disadvantages of acetylene weilding		Use oxyacetylene flame to cut metals. Carry out common welding of mild steel cast etc.	Guide the trainee to cut metals using acetylene flame	Welding equipment

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				Identify forging tools and carry out simple hand tools.	Introduce simple forging tool to the trainee	Forging tools and furnace
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Programme: National Vocational Certificate In Agriculture.

Module: BSB 211 Plants and Soil Biology

Duration: 30 hours (1 hour theory, 2 hours practical)

Unit: 2.0

Goal: This module is designed to provide the trainee with the basic knowledge of the interrelationship between the plants and the soil.

General Objectives: On completion of this module, the trainee should be able:-

- 1.0 Understand the structure of a flowering plant
- 2.0 Understand reproduction in plants
- 3.0 Understand the mechanism of osmosis and plasmolysis in plants
- 4.0 Understand the process of transpiration in plants
- 5.0 Understand the process of photosynthesis and respiration in plants
- 6.0 Understand tropism in plants
- 7.0 Understand the constituents, structure and characteristics of soil
- 8.0 Know the various methods of soil conservation and improvement

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PROGRAMME: National Vocational Certificate in Agriculture						
COURSE: Plant and soil biology			COURSE CODE: BSB 211		CONTACT HOURS: 30 hours (1 hr theory, 2 hrs practical)	
GOAL: This module is designed to enable the trainee to understand the interrelationship between plants and the soil						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective 1.0 Understand the structure of flowering plants				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Describe the external features of a dicotyledonous flowering plants,	Explain the functions of the different parts		Draw and label the plant describe in 1.1	Guide the trainee to draw..	
	1.2 Describe the external features of a named monocotyledons flowering plants (Zea Mays Andropogon)	Explain the functions of the different part		Draw and label the plants (Zea mays or Andropogon)		
	1.3 Explain the differences in external features of a monocot and dicot					
	1.4 Describe the functions of the different parts of a flowering plants	Explain the functions of root, stem and leaf		Observe the internal structure of the root, leaf and stem under the microscope, draw and label the parts	Guide the trainee to draw.	
	1.5 Relate the internal structure of the roots,					

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	stems and leaves to their functions					
	1.6 Differentiate between the internal structure of the different parts of a monocot and a dicot	Explain the internal structure of the leaf, stem, and root				
	General Objective: 2.0 Understand reproduction in plants					
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Differentiate between sexual and asexual reproduction in plants	Explain the differences.	Samples of demonic, hibiscus, allemande, cisalpine and Tacoma lowers	Draw and label a whole flower and the longitudinal section of the flower Allemande, hibiscus, demonic Tacoma cisalpine	Guide the trainee to carry out the experiment	Onion bulbs yam tubers cocoyam etc
	2.2 Identify the reproductive parts of a flower					
	2.3 Describe pollination and Fertilization	Explain the methods of pollination and fertilization				
	2.4 Describe the different types of fruits, seeds, and their mode of dispersal	List the different methods of asexual reproduction in plants		Draw and label whole and longitudinal sections of drupe, benary, caryopsis, bean seed, groundnut seed, castor oil	Guide the trainee to identify and draw	
	2.5 Describe the different type of storage organs	Explain bulbs rhizomes, tubers, corms	Charts	Identify the different types of storage organs, rhizomes, bulbs, tubers, corms draw and label	Guide the trainee to identify and draw	
	2.6 List and explain conditions necessary for germination	Explain the conditions.		Plants seeds and observe their germination process	Guide the trainee to	

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	2.7 Distinguish between hypogeal and epigeal germination				carry out the experiment	Corn seeds bean seeds
3.0	General Objective: Understand Osmosis and plasmolysis in plants					
	3.1 Define Osmosis, Plasmolysis.	Explain the sites where osmosis and plasmolysis take place				
	3.2 Describe the mechanisms of osmosis and plasmolysis.	List the conditions necessary for osmosis and plasmolysis				
	3.3 Differentiate between osmosis and plasmolysis			Carry out simple experiments to show how osmosis and plasmolysis take place in plants	Demonstrate the processes to the trainee	
	General Objectives: 4.0 Understand the concept of transpiration					
	4.1 Define transpiration in Plants	Explain transpiration		Observe stomata and guard cells under the microscope	Guide the trainee to carry out the observation and drawing	
	4.2 Define transpiration pull in plants	Explain how transpiration pull occurs		Draw and label a stoma and its associated guard cell as observed under a microscope		
	General Objective; 5.0 Understand the process of photosynthesis and respiration in plants					
	5.1 Define photosynthesis	Explain the process of photosynthesis				
	5.2 List the conditions necessary for	Explain the parts of the plant where		Carry out simple experiments to show the conditions listed	Demonstrate the process to the trainee	

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	<p>photosynthesis to take Place</p> <p>5.3 Define respiration in plants</p> <p>5.4 Differentiate between respiration, combustion and fermentation</p>	<p>photosynthesis takes place</p> <p>Explain how respiration takes place in a living cell. Differentiate between respiration and photosynthesis using reversible equation</p>		<p>in 5..2</p> <p>Carry out simple experiments to show that oxygen is taken up, while Co2 and heat are produced during plant respiration</p>	<p>Demonstrate the process to the trainee</p>	
General Objective: 6.0 Understand tropism in plants						
	<p>6.1 Define tropism and its different forms (phototropism, geotropism, chemotropism, hydrotropism, etc)</p> <p>6.2 Describe Auxins and their role in plant tropism</p>	<p>Explain the different forms of tropism</p> <p>Explain the role of auxins in plant tropism</p>		<p>Carry out simple experiments to show that phototropism, hydrotropism and chemotropism take place in plants.</p> <p>Identify other types of movements in plants</p>		<p>Demonstrate the process to the trainee</p> <p>Demonstrate the process to the trainee</p>
General Objective: 7.0 Understand the constituents, structure and characteristics of soil						
	<p>7.1 Describe the constituents, types and characteristics of soil.</p>	<p>Explain soil constituents, characteristics and types</p>	<p>Soil samples</p>	<p>Carry out simple experiments to determine soil profile by both sedimentation and digging methods</p>	<p>Demonstrate the process to the trainee</p>	

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	7.2 Describe the process of soil formation	Explain soil formation		Carry out simple experiments to relate soil structure to water retention capacity.	Guide the trainee to carry out the experiment	
	7.3 Describe the importance of air, water and humus in soil	Explain the capillarity and porosity of different types of soil		Determine experimentally the amount of air, water and humus in a given soil sample	Guide the trainee to carry out the experiment	
General Objective: 8.0 Know the various methods of soil conservation and improvement						
	8.1 Define soil erosion and list the various forms of soil erosion : Sheet, gully, wind, water, etc.	Explain ways of preventing soil erosion: cover crops, trees, terracing, mulching, strip cropping, contouring		Carryout a field trip to observe different forms of soil erosion	Guide the trainee to carryout the observation	
	8.2 Describe causes of soil fertility losses leaching, surface compaction, restructure of aeration, water – logging.					
	8.3 Define cultivation	Explain the different forms of cultivation crop rotation Mono cropping mixed cropping, fallowing, etc				
	8.4 Explain the roles of microorganisms in manufacturing soil					
	8.5 Explain the importance of plant conservation: A forestation, forest resources, plantations etc.	Describe the importance.				

Program: National Vocational Certificate In Agriculture.
Module: VAE 211, Crop Production Techniques

Duration: 50 hours (1 hour theory,, 4 hours practical)
Units: 3.0

Goal: This module is designed to provide practical skills in crops farming.

General Objectives

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

1. Know the general classification, identification, and botany of annual crops
2. Know the factors affecting the production of annual crops
3. Understand the management of crops after planting
4. Know the harvesting, handling, processing and storage of annual crops
5. Know the marketing process of annual crops produce

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PROGRAMME: National Vocational Certificate In Agriculture.						
COURSE: Crop Production Techniques			COURSE CODE: VAE 211		CONTACT HOURS: 50	
GOAL: This module is designed to provide the trainee with the knowledge and skill in crops production						
COURSE SPECIFICATION: Theoretical Contents: 1 hour				Practical Contents: 4 hours		
	General Objective 1.0 Know the general classification, identification and botany of cereal crops			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	1.1 Define annual crops 1.2 Describe the origin and geographical distribution of crops	Explain the crops to the trainee Explain the process to the trainee	Maps	Identify annual crops, draw and classify them according to their botany Identify varieties/cultivation of crops using major characteristics	Guide the trainee to carry out the classification Guide the trainee to locate geographical areas of crop production	Maps
	General Objective: 2.0 Know the factors affecting the production of crops					
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
2-4	2.1 Explain the effect of the following on crop production - Environmental - Sociological - Economic factors	Discuss the effect with the trainee				

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	<p>2.2 Explain the ecological requirement of common annual crops</p> <ul style="list-style-type: none"> - Temperature - Rainfall - Sunshine - Soil and edaphic factors <p>2.3 Explain crops adaptation to :-</p> <ul style="list-style-type: none"> - Soil pH - Soil type - Soil moisture require <p>2.4 Explain the principles of production under:-</p> <ul style="list-style-type: none"> - Site selection - Land preparation - Seed selection - Spacing <p>2.5 Explain the following terms planting rate, seed rate and population.</p> <p>2.6 Define fertilizer, fertilizer handling, organic fertilizer, and Inorganic Fertilizer.</p>	<p>Discuss the effect with the trainee</p> <p>Discuss the factors with the trainee</p> <p>Discuss the principles with the trainee</p> <p>Discuss the calculation of the terms listed in 2,5 with the trainee</p> <p>Explain the terms in 2.6</p>		<p>Cultivate and maintain a crop like maize, fibers,, tubers legumes and carry out the following activities</p> <ul style="list-style-type: none"> - Seed bed preparations - Fertilizer applications - Mulching - Watering - Spraying insecticides <p>Identify different types of fertilizer and their sources(Nitrogen fertilizer, compound fertilizer etc)</p>	<p>Guide the trainee to carry out the activities</p> <p>Guide the trainee to identify different types of fertilizer</p>	<p>Farm land Hoes Matchet Rakes Etc</p> <p>Assorted fertilizer</p>
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	2.7 Describe the methods of applying fertilizer to the soil	Explain fertilizer application		Calculate fertilizer rates for selected crops	Guide trainee in calculating the rates	Calculators
General Objective: 3.0 Understand the management of crops after planting						
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
5-6	3.1 Describe the following types of management - Thinning - Weeding - Disease and pest control	Discuss the management practices with the trainee		Carry out thinning, weeding, disease and pest control in the field and record	Guide the trainee to carry out the assignments	Hoes Cutlasses Matchet etc
	3.2 Explain the source of weeds diseases and pest in crop farms and their lifecycles	Describe the sources to the trainee	Lifecycle charts	Identify and record weeds diseases and pest of crops	Guide the trainee in the identification	Weeds, diseased crops, pest charts etc
General Objective: 4.0 Know the harvesting, handling processing and storage procedures of cereal crops						
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
7-11	4.1 Describe crops harvesting methods: - Manually - Modern equipment -	Discuss the processes with the trainee	Charts	Carryout harvesting of a cereal crop such as - Manually - Using modern equipment	Guide the trainee carry out the task	Hoe Hatchet Cutlasses Harvesters
	4.2 Explain the criteria for time of harvesting of various crops	Describe the timing process				

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	<p>4.3 Describe the general processes for handling various harvested crops in the field</p> <ul style="list-style-type: none"> - Manual - Using modern equipment <p>4.4 Describe the different methods (manually and mechanical) of crop processing e.g. destalking, threshing, sorting, grading decorticating</p> <p>4.5 Describe the use of major processing machines e.g. shellers</p> <p>4.6 Describe the end product of the processing of crops</p> <p>4.7 Describe methods of storing processes of crops</p>	<p>Explain manual and mechanical methods of handling</p> <p>Explain the processes to the Trainee</p> <p>Explain the working of the Sheller</p> <p>Explain the products</p> <p>Explain the methods</p>		<p>Carry out the processing of cereal crops manually and mechanically using threshers</p> <p>Carry out the shelling of a selected crop</p> <p>Process grains and bring out the end products e.g. husks Store processed crops</p> <p>Guide the trainee on storing procedures</p>	<p>Guide the trainee to carry out the exercise</p> <p>Guide the trainee to carryout the shelling</p> <p>Guide the trainee to carry out assignment</p>	<p>Thresher</p> <p>Shelling machine</p> <p>Grains, Silos, Bags, Sacks</p>
	General Objective: 5.0 Know the marketing process of crops					
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
12	5.1 Describe the marketing process of processed crop produce	Explain the marketing strategies		Market processed crops produce and record the sale, revenue, profit etc	Guide the trainee to carry out the task	Processed cereal crops produce

Programme National Vocational Certificate In Agriculture.

Module: VAE 212 Tree Crop Productions.

Duration: 40 Hours (1 Hour Theory, 3 Hours Lecture)

Unit 3.0

Goals: This module is designed to provide the trainee with the basic knowledge and skill on tree crops production.

General Objectives:

- 1.0 Know different types of various economic tree crops.
- 2.0 Know areas of production of various economic tree crops.
- 3.0 Understand the botany of important crops in Nigeria.
- 4.0 Know the production techniques of tree crops in Nigeria.
- 5.0 Understand the production cycle of major economic tree crops in Nigeria.

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	Course: Tree Crop Production	Course Code: VAE 212		Credit Hours: 3 hours/week		
				Theoretical: 1 hour/week		
	Year:	Pre-requisite:		Practical: 3 hours /week		
	Theoretical Content			Practical Content		
	General Objective 1:					
Week	Specific Learning Outcomes	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	<p>1.1 Identify the following tree crops cocoa, rubber, coffee, oil palm, kola , raffia palm etc.</p> <p>1.2 List the types of tree crops and their origin.</p> <p>1.3 Identify the types of tree crops suitable to different climate condition in Nigeria.</p>	<p>- Explain the types of economic tree crops.</p> <p>- Explain the origin and history of each tree crops in 1.1.</p> <p>- Explain the adaptation of the tree crops to Nigeria climate condition.</p>		<p>Identify the economic tree in the field, draw and record them, indicating their origin.</p> <p>Identify the economic trees against each climatic zones in Nigeria.</p>	<p>Guide the trainee to carry out the identification.</p>	
	General Objective 2.0: Know areas of production of various economic crops					
2	<p>2.1 Identify producing areas of the various economic tree crops.</p> <p>2.2 Identify main producing areas of economic tree crops in Nigeria.</p> <p>2.3 Compare figures for – Main producing areas.</p>	<p>- Explain the tree crops production areas in Nigeria.</p> <p>- Explain areas where economic tree crops are normally produced.</p>		<p>Identify the major producing areas of the major economic trees.</p>	<p>Guide the trainee to carry out the identification.</p>	

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	- Marginal areas.				
	2.4 Specify the production trends of the main tree crops producing areas in Nigeria.	- Explain the production trends of tree crops producing areas.			
General Objective 3.0: Understand the botany of important tree crops					
3	3.1 Describe the botany of each economic tree crop under the following heading: i) Taxonomy ii) Morphology iii) Anatomy iv) Structure and forms of fruits and seeds. 3.2 List the types of varieties of tree crops.	- Explain the botany of each economic tree crops. - Explain the varieties of economic tree crops in Nigeria.		Collect samples of the major economic trees in Nigeria. And classify them according to their: - taxonomy - morphology - Anatomy - Structure - Fruit forms - Seeds.	Guide the trainee to carry out the task.
General Objective 4.0: Know the production techniques of tree crops in Nigeria					
4	4.1 Describe the following operation for economic tree crop production. i) Site Selection ii) Nursery preparation iii) Site Clearing iv) Planting date, spacing, plant population v) Holding, transplanting	- Explain the methods of crop production in Nigeria.		Carryout site selection and clearing for tree crop farming. Raise tree crops in the nursery. Carryout the planting of tree crop in the farm.	Guide the trainee to carry out the task.

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	<p>vi) Pruning, objectives and methods</p> <p>vii) (a) Diseases and pest of crops (b) Principles of crop protection</p> <p>4.2 Identify the chemicals for spraying different types of economic tree crops.</p> <p>4.3</p> <p>4.4 Describe harvesting, processing technique, grading and marketing of processed produce.</p> <p>4.5 List implements for harvesting, processing and grading of processed produce.</p>	<p>- Explain the types of chemicals used for spraying tree crops.</p> <p>- Explain to the trainee the harvesting and processing techniques, and the grading of processed produce.</p> <p>Describe the implements.</p>	<p>Charts.</p>	<p>Carry out the transplanting, pruning. Spray the crops against with pesticides.</p> <p>Carry out spraying of chemicals of different types, rates on types of diseases and pests of tree crops.</p> <p>Carry out lining, holing, transplanting, mulching, pouring of diseased branches of economic tree crops.</p> <p>Identify implements for harvesting, processing and grading of processed produce.</p>	<p>Guide students on how to carry out the spraying of chemicals.</p> <p>Demonstrate to the trainee methods of holing, transplanting, mulching, pruning etc.</p> <p>Guide trainee in identifying the implements.</p>	<p>Chemicals</p>
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General Objective 5.0: Understand the production cycle of major economic tree crops in Nigeria						
5	5.1 Describe the life cycle of major economic tree crops e.g. cocoa, kola-nut, citrus, oil palm, rubber etc.	- Explain the life cycle of major economic tree crops.				
	5.2 Describe the yield capacity of major economic tree crops.	- Explain the yield capacity of the economic tree crops.				

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Programme : National Vocational Certificate In Agriculture
Module : VAE 213 Cattle Production

Duration : 40 Hours (1Hour Lecture and 3 hours practical)

Unit : 3.0

Goals : This module is designed to provide the trainee with the basic knowledge and skill in Cattle Breeding.

General Objectives:

1. Understand the development of cattle breeding in Nigeria.
2. Understand the technique of cattle production.
3. Know the techniques of Milking.
4. Know farm record keeping and marketing of beef and dairy products.

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PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: Cattle Breeding			COURSE CODE: VAE 213		CONTACT HOURS: 40 hrs	
GOAL: This module is designed to provide the trainee with the knowledge and skill in cattle breeding.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: Understand the development of cattle breeding in Nigeria.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	1.1 Explain the origin of cattle breeding in Nigeria.	<ul style="list-style-type: none"> Discuss the origin of cattle breeding. 				
	1.2 Describe the purpose of cattle breeding. - milk - meat - work	<ul style="list-style-type: none"> Explain the purpose of cattle breeding. 				
2	1.3 Describe the breeds of cattle in Nigeria.	<ul style="list-style-type: none"> Discuss the breeds of cattle in Nigeria. 		1.3 Recognize the different breeds of cattle in Nigeria, such as indigenous, breed as: Sokoto, Gudali, White Fulani, Wadaro, Red bororo, Kuri, Ndama etc. The exotic breeds: - Beef master	Guide the trainee to recognize.	

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				<ul style="list-style-type: none"> - Holstain Fristein - Gurisey - Jersey Aberdeen Argues etc 		
3	1.4 Define some terminologies used in cattle production: <ul style="list-style-type: none"> - breed - yeanling - cow, bull, calf, heifer etc. - freemartin - chutes etc. 	<ul style="list-style-type: none"> • Explain the terminologies. 				
General Objective: 2.0 Understand the technique of cattle production.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
4	2.1 Describe the types of cattle production and state criteria for the selection.	<ul style="list-style-type: none"> • Explain the productions types and selection criteria. 	<ul style="list-style-type: none"> • 		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
	2.2 Explain the cattle selection process. 2.3 Describe the selection methods. <ul style="list-style-type: none"> - pedigree - profaning testing - showing winning selection method. - individual merit selection. 	“				<ul style="list-style-type: none"> •

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5	2.4 Describe cattle breeding processes. - mating methods - mating ratio - heat period - signs of heat - bull testing - model beef and dairy breeding programme - gestation - signs of parturition - parturition - weaning period	<ul style="list-style-type: none"> • Explain the processes. 		2.5 Recognize cattle on heat.	Guide the trainee to recognize.	<ul style="list-style-type: none"> •
6	2.5 Describe the housing and cattle.	<ul style="list-style-type: none"> • Explain the housing structure and the equipment for cattle breeding. 		2.5 Design a house for Cattle and construct simple feeding and watering equipment.	<ul style="list-style-type: none"> • Guide the designing and construction. 	
	2.6 Describe the equipment for cattle breeding.	<ul style="list-style-type: none"> • Explain the equipment. 		2.6		
	2.7 Describe the digestive system of cattle as a ruminant.	<ul style="list-style-type: none"> • Explain the system. 		2.7 Draw the digestive system of cattle and label the parts.	<ul style="list-style-type: none"> • Guide the trainee. 	
	2.8 Describe grasses and legumes for cattle feeding.	<ul style="list-style-type: none"> • Explain the grasses. 				
7	2.9 State the nutritional value of various grasses and describe the factors that affect nutritional	<ul style="list-style-type: none"> • State the nutritious values of the grasses and 		2.10 Recognize grasses and legumes and prepare a pasture album.	<ul style="list-style-type: none"> • Instruct the trainee to identify and prepare an 	

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	value of a pasture.	legumes.		- graze animals condense forage by making hay and silage.	album. • Instruct the trainee to graze animals.	
	2.10 Define concentrates	• Explain the term.		2.10 Recognize types of concentrates. - prepare a balance ratios dairy cows, wearers etc.	• Guide the preparation.	•
8	2.11 Describe the following management operations: - Identification - Dipping/Spraying - Dehorning - Castration - Weighing	• Explain the processes.		2.12 Carry out the operations.	• Guide the trainee to carry out the operations.	•
	2.12 Describe the diseases and pest of cattle.	• List the diseases and pest.		2.12 Diagnose various diseases and pest of cattle.	• Guide the trainee to carry out the operations	•
	2.13 Describe the prevention of the disease through: - management - vaccination - drugs	• State their prevention methods.		2.13 Diagnose various diseases and pest of cattle.	• Guide the trainee to carry out the operation	•
General Objective: 3.0 Know the techniques of milking						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
9	3.1 Describe the internal structure of the udder and explain milk let	• Explain the term.		3.1 Recognize milk and milk products.	Guide the trainee to carry out the recognition	

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	down.					
	3.2 Describe the factors that affect quality and quantity of milk.	<ul style="list-style-type: none"> Explain the factors. 	<ul style="list-style-type: none"> 	3.2 Prepare and milk cow using various techniques process and store milk.	<ul style="list-style-type: none"> Guide the trainee to carry out the task. 	<ul style="list-style-type: none"> Restraining materials Drought animals
General Objective: 4.0 Know farm record keeping and marketing of beef and dairy products.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
10	4.1 Describe cattle markets.	<ul style="list-style-type: none"> Explain the market place. 		4.1 Locate a cattle market.	<ul style="list-style-type: none"> Guide the identification. 	
	4.2 Describe the standard beef and dairy conformation.	<ul style="list-style-type: none"> Explain the term. 		4.2 Locate cattle with proper conformation.	<ul style="list-style-type: none"> Guide the conformation and the selling and buying of cattle 	
	4.3 List the various production and accounting record in cattle production.	<ul style="list-style-type: none"> Explain to the trainee the procedures. 		4.3 Sell or buy cattle with proper conformation.		
11	4.4 Explain the importance of record keeping in cattle production enterprise.	<ul style="list-style-type: none"> Discuss the process and it's importance to cattle business. 		4.4 Design, breeding, milking and accounting record for cattle production enterprise		

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE

COURSE: VAE 214, Farm Structure

DURATION: 40 Hours (1 Hour theory, 3 Hours Practical)

UNIT: 3.0

Goal: This module is designed to provide the trainee with the basic knowledge and skill in the techniques of farm structures.

General Objectives:

On completion of this course the trainee should be able to:

1. Know the construction of various farm structures.
2. Understand the safety rules on construction site and farm structures.

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PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: Farm Structure			COURSE CODE: VAE 214		CONTACT HOURS: 40 Hrs	
GOAL: The module is designed to provide the trainee with the skill and knowledge in the techniques of farm structures.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0 Know the construction of various farm structures.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1 – 2	1.1 Describe the construction procedure of chicken pens, pig pens and snail pens.	Demonstrate to the trainee how to carry out the constructions of the various animals pens	Pen models	Construct chicken pens, pig pens and snail pens in the farm	Guide the trainee to carry out the task	Farm construction and building materials such as shovels, head pan digger, etc.
3 – 4	1.2 Describe the construction procedure of traditional storage structures such as rhombus, yam barns.	Demonstrate to the trainee how to carry out the construction of rhombus yam barns	Model of silos	Construct storage structures such as rhombus yams e,t.c. in the farm.	Guide the trainee to carry out the task.	Shovels, head pans, diggers, ram maize status.
4 – 5	1.3 Describe the construction procedure of modern storage structures such as	Demonstrate to the trainee how to carry out the construction of silos.	Models of dam, ponds, water trough in the form of charts.	Construct grain silos in the farm.	Guide the trainee to carry out the task.	Construction and building materials.

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5 – 6	silos. Describe the construction procedure of dams, ponds and water trough.	Demonstrate to the student how to carry out the construction of dams, ponds and water trough.		Construct dam, pond, and water trough in the farm.	Guide the student to understand the task.	Construction and building materials.
General Objective: 2.0 Understand the safety rules on construction site and farm structures						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
7 – 8	2.1 Explain the safety rules on construction site at the farm.	Describe to the trainee the safety rules during the construction process.	Models in form of charts.	Carry out the safety precaution measures at the construction site in the farm.	Show the trainee the safety measures to be taken during construction.	Building and construction materials, such as blocks, spades diggers.
9 – 10	2.2 Explain the safety rules in handling chicken pens, pig pens, milking room.	Describe to the student the safety rules in handling chicken and pig pens and milking parlour.	Models such as charts.	Carry out safety precaution measure at the poultry pen, pig pen and milking parlour.	Guide the trainee to carry out the task.	Safety and sanitary materials such as chemicals, broom, rake, etc.
11	2.3 Describe the safety rules in handling traditional and modern storage facilities, such as rhombus, silos, warehouse, etc.	Explain to the trainee the safety rules in handling the structures.	Models in form of charts.	Carry out the safety precaution measures in the rhombus, silos, and ware house.	Guide the trainee to carry out the task.	Rhombus silo ware house chemicals
12	2.3 Describe the safety rules in dams, ponds, water trough, etc.	Explain the safety, procedures to the trainee in handling the structure.	Models in farm of charts.	Carry out the safety precaution measures at the pond, dam sites.	Guide the trainee to achieve the task.	Ponds, dams, water rough chemicals.

Programme:	National Vocational Certificate In Agriculture
Course Title:	Agricultural Machines and Implements Maintenance I
Course Code:	VAE 215.
Course Duration:	40 (1 theory, 3 hours practical)
Course Unit:	4.0
Goal:	The module is designed to provide the trainee with the knowledge to identify, use, maintain and repair different farm implements and machine.

General Objectives:

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

- 1.0 Know various tillage implements.
- 2.0 Know the different types of planting equipment and be able to maintain them.
- 3.0 Know different types of fertilizer applicators and manure spreaders.
- 4.0 Understand the working principle of inter row machinery and be able to repair and maintain the machinery.
- 5.0 Know different types of spraying and dusting equipments.

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PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: AGRICULTURAL MACHINE AND IMPLEMENTS MAINTAINANCE. I			COURSE CODE: VAE 215	CONTACT HOURS: 40 HOURS		
GOAL: This module is designed to provide the trainee with the knowledge to identify, use, maintain and repair different farm implements and machines.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
1.0	General Objective: Know various tillage implements					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 State the working principles of disc ploughs, disc harrow, ridgers and rotavators	List the various types of the arrangement.	Sketches, Diagrams.	Recognize the various types of harrow and plough arrangement e.g. single row, multi-row, straight arrangement and vee-arrangement.	Guide the trainee in identifying the various types of harrows	Tillage implement
	1.2 Describe the various types of ploughs and harrow arrangements.					
	1.3 Describe various parts of harrow and plough.	Explain their purposes.	Sketches, diagrams.	Identify the various parts of harrows and ploughs e.g. disc, shaft, flanges, draw bars, tool bars and attachments	Guide the trainee in recognizing the implement	Harrows and ploughs

WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
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	1.4 Describe the general maintenance of tillage implements.	Explain the maintenance procedure	Maintenance Manual	Remove and install worn or damaged disc or blades on ploughs, harrows, rotavators and ridgers.	Demonstrate the installation of disc, blades on plough, harrow etc	Tillage implements
	1.5 Describe the maintenance of disc bearings.	Explain the maintenance process.	Maintenance manual	Remove, inspect for wear and replace worn out disc bearings.	Carry out the replacement of worn out disc bearings inspection for any wear and tear with the trainee.	Plough, harrow.
	1.6 Describe the workshop and field adjustment of tillage implements.	Explain the steps followed.	Maintenance manual	Perform workshop and field adjustments on ploughs, harrows etc.	Carryout workshop and field adjustments on ploughs, harrows, rotavators and ridgers.	Tillage implements, tool boxes

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WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
2.0	General Objective Know the different types of Planting Equipment and be able to maintain them.					
	2.1 State the working principles of planting equipment.	Explain the working principles of planting equipment.	Sketches, charts	Identify different types of planting equipment e.g. grain drill, grass drill etc	Guide the trainee in recognizing the various types of planting equipment.	Planting equipment
	2.2 Describe the operational adjustment and setting of application rate planting equipment.	Explain operational adjustment, settings and checking of application rate.	Diagram manual	Carryout operational adjustment, setting and checking of application rate.	Demonstrate the operational adjustment and checking of application rate.	Planting equipment Seeds, tool boxes
	2.3 Describe the maintenance of planting equipment.	Explain the maintenance procedure.	Maintenance manual	Dismantle planting equipment and replace worn or damaged parts.	Guide the trainee to check and remove and replace damaged parts.	Tool boxes, planting equipment.
	2.4 Describe the attachment of planting equipment to a tractor.	Explain the sequence of attachment.	Sketches	Couple, use and discouple planting equipment to a tractor.	Guide the trainee to couple and discouple planting equipment to a tractor	Planting equipment, Tractor

WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
3.0	General Objective Know different types of Fertilizer Applicators and Manure Spreaders					
	3.1 State the principles of fertilizer applicators and manure spreaders.	Explain the principles of fertilizer applicators and manure spreaders.		Identify different types of fertilizer application and manure spreader.	Guide the trainee.	Fertilizer applicators, spreaders
	3.2 Describe the maintenance of the items in 3.1 above.	Explain the maintenance of both fertilizer applicator manual spreader.	Maintenance manual.	Carryout maintenance on both fertilizer applicator and manure spreaders	Demonstrate to the trainee how to carry out maintenance on applicators and spreaders.	Fertilizer Applicator
	3.3 Describe the calibration of application rate for fertilizer.	Explain calibration.	Calibration chart	Calibrate application rate for fertilizer.	Demonstrate to the trainee how to calibrate the rate	Fertilizer Applicator
	3.4 Describe fertilizer application and manure spreader.	Explain the uses in agriculture.	Sketches, diagrams.	Operate fertilizer applicator and manure spreaders.	Demonstrate to the trainee how to operate fertilizer applicator and manure spreaders.	Tool box Fertilizer Spreaders
	3.5 Describe the maintenance of fertilizer applicator and manure spreader.	Explain the maintenance of the two machines.	Maintenance manual			Tool box manure

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	3.6 Describe the dismantling, replacement and repairs of damaged and worn out parts of fertilizer applicator and manure spreader.	Explain the sequence	Sketches, manual	Dismantle, assemble, replace or repair damaged and worn out parts.	Demonstrate how to dismantle, assemble, replace or repair damaged worn out parts.	
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WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
						assemble
4.0	General Objective: Understand the Working Principles of Inter row Machinery and be able to Repair and Maintain the Machinery					
	4.1 State the working principles of inter-row machinery.	Explain the working principles of inter row machinery.	Sketches, Diagrams	Identify different types of inter-row machinery	Guide the trainee to carry out the task.	Inter-row machinery Tool box.
	4.2 Describe inter row steerage Hoe, accessory and fitting.	Explain Inter row steerage hoe, accessory to the trainee.	Sketches, diagrams	Carry out operational adjustment adjustment of the equipment	Demonstrate to the trainee how to carry out the adjustment.	
	4.3 Differentiate between weeders and cultivators.	Explain the difference between weeders and cultivators.	Diagrams	Identify the two types of implements	Guide the trainee to identify	Weeders, cultivators
	4.4 Describe the attachment of inter-row machinery to a tractor.	Explain sequence of attachment	Sketches.	Mount, use and dismount inter-row machinery from tractor.	Demonstrate to the trainee how to mount and dismount inter-row machinery.	Inter-row machinery.

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WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	4.5 Describe the general maintenance of inter-row machinery	Explain the general maintenance procedure.	Maintenance manual	Repair or replace worn or damaged parts.	Demonstrate how to repair or replace damaged parts.	Inter-row machinery
5.0	General Objective: Know different types of Spraying and Dusting Equipments					
	5.1 State the principle of spraying and dusting equipment.	Explain the working principle of spraying and dusting equipment.	Sketches, diagrams	Identify types of spraying and dusting equipment.	Guide the trainee	Spraying and dusting equipment. Spraying and dusting equipment.
	5.2 Describe the maintenance of spraying and dusting equipment.	Explain the maintenance procedure.	Maintenance manual.	Maintain spraying and dusting equipment.	Demonstrate to the trainee how to maintain spraying and dusting equipment.	
	5.3 Describe the application rate for spraying and dusting chemicals.	Explain calibration chart.	Calibration chart.	Calibrate application rate for spraying and dusting chemicals.	Demonstrate to the trainee how to calibrate application rate.	
	5.4 Describe spraying and dusting equipment	Explain their uses in agriculture.	Sketches and diagrams	Operate all spraying and dusting equipment.	Guide the trainee to operate spraying and dusting equipment.	

WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	5.5 Describe the service and	Explain the service and	Maintenance	Dismantle,	Demonstrate to	Dismantle

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	maintenance of spraying and dusting equipment.	maintenance of spraying and dusting equipment.	manual.	assemble, replace or repair damaged or worn out parts.	trainee how to dismantle and replace parts.	parts, spraying, dusting equipment, tool boxes
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Programme: National Vocational Certificate in Agriculture.

Module: BSB 221 Animal Biology

Duration: 30 Hours

Unit: 2.0

Goal: This module is designed to introduce the trainee to the biology of vertebrate and invertebrate animals

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

- 1.0 Understand the external features and general characteristics of invertebrate animals.
- 2.0 Understand the external features and characteristics of vertebrates
- 3.0 Know the different types of bones making up the skeleton of a mammal
- 4.0 Know the different types of joints in the body of mammal
- 5.0 Know how animals feed
- 6.0 Understand dentition in mammals
- 7.0 Understand the main features of circulatory system and the functions of the components of the system and blood
- 8.0 Understand the process of respiration in mammals
- 9.0 Know the different excretory organs of mammals and the excretory system
- 10.0 Understand control and co-ordination in mammals
- 11.0 Know the reproductive process in mammals

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PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: Animal Biology		COURSE CODE: BSB 221		CONTACT HOURS: 30 hours (1 hr theory, 2 hrs practical)		
GOAL: This module is designed to introduce the trainee to the biology of vertebrates and invertebrate animals						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0 Understand the external features and general characteristics of some invertebrate animals				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	<p>1.1 List the general characteristics features of invertebrates</p> <p>1.2 List the specific characteristics of each phylum of the invertebrates e.g protozoa, coelenterates platy helminthes, neimatodam arthropod mollusca etc</p> <p>1.3 Describe the phylum to which the following invertebrates belong: amoeba, paramaecium, hydra, fasciola, tapeworm, millipede, centipede, mosquito, housefly, bees, cockroaches, snail etc.</p>	<p>Explain the characteristics of invertebrate</p> <p>Explain the characteristics of each phylum</p> <p>Explain the phylum to which they belong.</p>	<p>Charts</p>	<p>Identify the phylum to which the following invertebrates belong ameoba, paramecium, hydra, fasciola, tape worm, millipede, centipede, mosquito, housefly, bees cockroaches, snail etc</p>	<p>Guide the trainee to carry out the identification</p>	<p>Prepared slides preserved specimens of cockroaches, tape worm millipede centipede etc</p>

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<p>1.4 Describe the external features of the invertebrates listed in 1.3 above.</p> <p>1.5 Describe the life history of the invertebrates listed in 1.3 above</p>	<p>Explain the external features of the invertebrates.</p> <p>Explain the life history of the invertebrates</p>	<p>Charts</p> <p>Charts</p>	<p>Observe and draw the external features of the invertebrate listed as 1.3 above</p>	<p>Guide the trainee to carry out the observation</p>	
<p>.General Objective: 2.0 Understand the external features and characteristics of vertebrates</p>					
<p>2.1 List the general characteristics features of vertebrates</p> <p>2.2 List the specific characteristics features of each class of vertebrates e.g. Pisces (fish), amphibians, reptilian, aves and Mammal.</p> <p>2.3 Describe the class to which the following animals belong: bony fish, lizard toad, bird and small mammals.</p> <p>2.4 Describe the external features and the life – history of each animal mentioned in 2.3 above</p>	<p>.Describe the general characteristic features to the trainee according to the class of vertebrates. Describe the characteristic features of the vertebrates mention.</p> <p>Explain the class to which the animals belong.</p> <p>Explain the external features to the trainee</p>	<p>Charts</p> <p>Charts of the life cycle of the animals</p>	<p>Identify the class to which the following animals belong, Bony fish, lizard, toad, bird and small mammals</p>	<p>Guide the trainee to identify the classes</p>	<p>Preserved specimens of fish, lizard, toad, bird and rat.</p>

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	2.5 Identify the external features of typical representative of the classes in 2.2 above.	Explain the external features of each representative.	Charts	Observe and draw the external features of typical representative of the classes in 2.2 above	Guide the trainee to observe and draw the external features	
General Objective: 3.0 Know the different types of bones making up the skeleton of a mammal						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	3.1 Describe the general plan of the mammalian Skeleton 3.2 State the functions of the skeleton 3.3 List the components of the axial and appendicular skeleton 3.4 Describe the bones of axial and appendicular skeleton.	Explain the plan of the skeleton and the function. Explain the features of the bones.	 Samples of the various bones.	 Observe, draw and label the specific bones of axial, and appendicular skeleton e.g. Cervical, Thoracic, lumber, sacral, scapula radius ulna humans	 Guide the trainee in the identification process	 Various bones sample
General Objective: 4.0 Know the different types of joint in the body of mammals						
	4.1 List the different types of joints in mammals e.g. movable, immovable, ball and socket, hinge, stature Etc. 4.2 Describe where each type of joint listed in 4.1	Explain the different types of joints in mammals Explain the positions of the	Mammalian skeleton Charts	 Identify where each type of joint listed in 4.1 above	 Guide the trainee to	 Mammalian skeleton

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	occurs in the body.	joints in the body.		occurs in the body of the mammal	make the identification	
	4.3 Explain the role of muscles in movement	Describe the role of muscles in movement	Mammalian skeleton Charts			
	4.4 Describe the mode of function of each type of joints	Explain the function.				
General Objective: 5.0 Know how animals feed						
	5.1 Differentiate between the food of plants and those of animals	Explain the differences to the trainee				
	5.2 Differentiate between auto trophic and hotero trophic.	Explain the differences to the trainee				
	5.3 Explain the different types of autotrophic and heterotrophic types of nutrition	Describe the different types of nutrition				
	5.4 Explain parasitic and saprophytic types of Feeding	Describe the different types of feeding				
	5.5 List the different stages of feeding in mammals (ingestion, digestion, absorption, assimilation and egestion)	Describe the stages of feeding to the trainee	Charts			

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5.6 Explain the mechanisms involved in the different stages listed in 5.5 above	Describe the mechanism to the trainee					
5.7 Describe the action of ptyalin, rennin and pepsin on food.	Explain the action of the enzymes on food.	Charts.		Carry out simple experiment to show the action of ptyalin, rennin and pepsin on food	Demonstrate the experiments to the trainee	Food samples
5.8 Describe the digestive system of man	Explain the digestive system using a chart.	Chart.		Draw and label the digestive system in man	Guide the trainee to draw	Charts of man digestive system
5.9 Explain the function of liver and pancreases in Man	Describe the function to the trainee					
5.10 Describe the digestive system of a small mammal eg rabbit, rat, guinea pig.	Explain the digestive system. Using a chart.	Chart.		Dissect, draw and label the digestive system of a small mammal e.g. rabbit, rat, guinea pig	Guide the trainee to carry out the assignment	Dissecting kit rabbit rat, guinea pig
5.11 List the components of food substances of Man.	Explain the food components to the trainee					
5.12 State the importance of the components listed in 5.11 above.	Explain their Importance					
5.13 Describe the Importance of balance diet to good health	Explain the importance to the trainee					
5.14 Describe proteins, carbohydrate and fat	Explain proteins, carbohydrate and fat.			Identify proteins carbohydrate and fat by simple laboratory test	Guide the trainee to carry out the tests	Food samples

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General Objective: 6.0 Understand dentition in mammals						
6.1 Describe the structure of a tooth and its insertion in the jaw Bone.	Explain the structure of a tooth to thee trainee	Chart of tooth structure				
6.2 List the different types of teeth.	Explain the different types of teeth and their function	Chart of different types of tooth				
6.3 Explain the functions of the different types of Teeth.						
6.4 Relate dentition as illustrated by herbivore a carnivore and Omnivore.						
6.5 Explain the importance of dental care.	Describe the importance of dental care					
6.6 Describe the mammalian tooth.	Explain the structure, cross section and the longitudinal section of the mammalian tooth.	Chart.	Draw and label tooth, cross section and longitudinal section of a mammalian tooth	Guide the trainee to draw and label	Mammalian tooth	
General Objective: 7.0 Understand the main features of the circulatory system and the components of the system and blood						

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7.1 Describe the various organs of circulatory System	Explain the various organs to the trainee	Charts of circulation system			
7.2 Draw the various organs of the circulatory system.	Explain how to draw the organs.	„	Identify the various organs of circulatory system draw and label the parts	Guide the trainee to identify and draw	Chart of circulatory system
7.3 Explain the function of the major components of circulatory system.	Describe the functions of the major components	Charts of circulatory system			
7.4 Describe diagrammatically the process of blood circulation in mammals	Explain the process to the trainee	Charts of mammalian circulatory system			
7.5 Differentiate between soluble single open And closed system of Circulation.	Explain the differences.				
7.6 List the components of Blood, white blood corpuscles, red blood corpuscles etc.	Explain the blood components				
7.7 Differentiate between blood and lymphatic System	Explain the different between blood and lymphatic system				
7.8 List the function of blood and its various components	Explain the function of blood and the mechanism of				

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	7.9 Explain the mechanisms of the clotting of blood	clotting				
	7.10 Describe the structure of a typical mammalian heart	Explain the structure to the trainee	Chart of mammalian hear			
	7.11 Explain the working of the heart	Describe the working of the heart		Draw a typical mammalian heart and label		
General Objective: 8.0 Understand the process of respiration in mammals						
	8.1 Define respiration	Describe respiration				
	8.2 Differentiate between aerobic and anaerobic Respiration	Describe the respiration process to the trainee				
	8.3 List the components of the respiratory system of mammals	Explain the components to the trainee				
	8.4 Describe the respiratory system of a dissected animal	Explain the components.	Chart of a dissected animal.	Draw and label the respiratory system from a dissected animal	Guide the trainee to draw	Dissected animal
	8.5 Differentiate between inhalation (Breathing – in) and exhalation (Breathing-out)	Explain the differences to the trainee				
	8.6 Describe the process of gas and heat production in respiration.	Explain the processes.		Carry out experiments to show gasses and heat production in respiration	Guide the trainee to carry out the experiments	
	8.7 Explain the role of oxygen in tissue respiration	Describe the role.				

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8.8 Describe the respiratory system in mammals.	Explain the system.	Chart of mammalian respiratory system.	Draw and label the respiratory system in mammals	Guide the trainee to draw and label	Chart of mammalian respiratory system.
General Objective: 9.0 Know the different excretory organs of mammals and the excretory system					
9.1 List the different excretory organs of Mammals	Describe the excretory organs	Chart.	Identify the different excretory organs of mammals	Guide the trainee in the identification	Charts of excretory organs
9.2 Describe the structure of the mammalian kidney.	Explain the structure.		Draw and label across section of a kidney.	Guide the trainee to draw and label.	Charts of cross section of a kidney
9.3 Explain the process of excretion as carried out by the kidney	Describe the excretory process		Identify the products of excretion in the kidney	Guide the trainee to identify.	Excretory products
9.4 Describe the products of excretion in the kidney.	Explain the products.				
9.5 Describe some of the diseases of the kidney (causes, symptoms, prevention and control)	Explain the diseases				
9.6 Describe the cross section of mammalian skin.	Explain the cross section of skin.	Chart of mammalian skin.	Draw and label the cross section of mammalian skin from a prepared slide	Guide the trainee to draw and label	Prepare slide of skin
9.7 Describe the products of respiration by skin, kidney, lungs, large intestine.	Explain the products.		Identify the product of respiration by a. Skin b. Kidney c. Lungs d. Large intestine	Guide the identification	Microscope

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General Objective: 10.0 Understand control and coordination in mammals						
10.1	List the components of the central and peripheral nervous systems.	Explain the components to the trainee	Charts of eye, ear, nose and tongue			
10.2	Describe the external structure of the brain and spinal cord.	Explain the external structure				
10.3	Distinguish between Reflex and voluntary action	Explain the differences between the two action				
10.4	Trace the paths of reflex action	Explain the paths				
10.5	Demonstrate simple reflex action e.g. knee, joint..	Explain the action				
10.6	List the principle sense organs (eye, ear, nose, skin and tongue)	Describe the principle sense organs mention				
10.7	Describe the location of the sense organs mentioned in 10.6 above.	Explain the location of the organs.		Identify the location of the sense organs mention in 10.6 above	Guide the trainee to identify the location	Charts of eye, ear, nose and tongue
10.8	Describe the structure of the eye, ear and skin.	Explain the structures.		Draw and label the structure of the eye, ear and skin	Guide the trainee to draw	
10.9	Describe simple eye defects and their methods of Corrections	Explain simple eye defects				

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	10.10 Explain the nature and function of hormones in man	Describe the nature and functions of hormones				
	10.11 Explain the functions and associated defects of some hormones in man.	Describe the functions and defects in detail				
	10.12 Describe the location of each hormones in man e.g. tyrosine, insulin, adrenal etc.	Explain the various hormones in man				
	10.13 Describe the process of maintenance of constant body temperature by Mammals	Explain the process to the trainee				
General Objectives: 11.0 Know the reproductive process in mammals						
	11.1 Describe the male and female reproductive organs in mammals.	Explain the reproductive organs..	Charts of male and female reproductive organs.	Identify the male and female reproductive organs in mammals	Guide the trainee in identifying the organs	Charts of male and female reproductive organs.
	11.2 Describe the structure of the male and female reproductive organs in 11.1	Explain the structures.		Draw and label the male and female reproductive organs	Guide the trainee	
	11.3 Explain the process of fertilization in Mammals.	Describe the process in 11.3 to the trainee				

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	<p>11.14 Explain the development, nutrition and respiratory of embryo resulting from fertilization</p>	<p>Describe the different process in fertilization</p>				
	<p>11.5 Explain the full period of gestation in Mammals</p>	<p>Describe the gestation period to the trainee</p>				
	<p>11.6 Describe the delivery process in mammals</p>	<p>Describe the delivery process</p>				
	<p>11.7 Explain the importance of sex education mammals.</p>	<p>Discuss sex education and its importance</p>				
	<p>11.8 Describe the different methods of family planning</p>	<p>Explain family planning and different methods of family planning</p>	<p>Pills, loop diaphragm</p>			
	<p>11.9 Explain the significance of courtship behaviour in mammals</p>	<p>Discuss the courtship behaviours in mammals</p>				

Programme: National Vocational Certificate In Agriculture

Course: VAE 221Floriculture

Duration: 40 hours (1 hour lecture, 3 hours practical)

Units: 3.0

Goal: This module is designed to provide the trainee with the basic skill and knowledge on floriculture

General Objectives

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

1. Know floriculture and its importance
2. Understand the different methods of propagating ornamental plants
3. Understand the principle and practice of ornamental horticulture

NVC in Agriculture (Draft)

PROGRAMME: National Vocational Certificate In Agriculture.						
COURSE: Floriculture (Ornamental Horticulture)			COURSE CODE: VAE 221		CONTACT HOURS: 40 hours	
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in floriculture						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
	General Objective 1.0 Know floriculture and its importance			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Define and explain floriculture 1.2 Explain the role of floriculture in the Nigeria economy 1.3 Describe ornamental plants and classify them on the following basis; - Lifespan - Structure and form - Leaf retention	Explain and discuss the term to the trainee Discuss the role of ornamental plants to the economic development.		Identify different ornamental plants and classify them on the basis of: - Lifespan - Structure and form - Leaf retention	Guide the trainee to perform the classification	
	General Objective: 2.0 Understand the different methods of propagation of ornamental plants					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Describe asexual and sexual reproduction in plants 2.2 Describe the process of germination and factors affecting it	Explain the terms stating their advantages and disadvantages		Carryout asexual and sexual propagation of ornamental plants	Guide the trainee to carry out the task	

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	<p>2.3 Describe the methods of sowing seeds. Sowing in the nursery</p> <p>2.4 Describe the natural means of vegetative propagations</p> <ul style="list-style-type: none"> - Suckers - Rhizomes - Tubers - Bulbs - Corms <p>2.5 Describe various methods of artificial propagation</p> <ul style="list-style-type: none"> - Layering - Cutting - Grafting - Budding <p>2.6 Describe seed germination process in the nursery</p>	<p>Explain the process</p> <p>Explain the processes</p> <p>Explain the processes</p> <p>Explain the process</p>		<p>Raise ornamental seedlings by sowing seed</p> <p>Propagate ornamental plants by the various methods</p> <p>Raise seedlings in the nursery by sowing seed</p>	<p>Guide the trainee to carry out propagation</p>	
<p>General Objective: 3.0 Understand the principles and practices of ornamental horticulture</p>						
	<p>3.1 Describe the establishment and management of pot plants and established Flowers</p> <p>3.2 Describe the establishment and management of ornamental plants for landscaping</p>	<p>Explain the process</p> <p>Explain the processes</p>		<p>Raise flowers by cutting. Establish and manage plants for landscaping</p>	<p>Demonstrate the processes</p>	<p>Potted flowers</p>

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.

COURSE: VAE 222 Crop Processing.

DURATION: 40 hours (1 hour theory, 3 hours practical)

UNIT: 3.0

Goal:

General Objectives: This module is designed to provide the trainee with the basic knowledge and skill in crop processing.

On completion of this course the students should be able to:

- a. Understand the processing of harvested annual crops.
- b. Know the major crops processing machines.
- c. Know the methods of storage of field processed crops products.

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURAL						
COURSE: Crop Processing.			COURSE CODE: VAE 222		CONTACT HOURS: 40 HOURS	
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in crop processing.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0 Understand the processing of harvested annual crops.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Describe the various processes of handling harvested annual crops in the field - - manually - modern equipment. 1.2 Describe the different methods of crop processing - - manual - mechanical.	Explain the use of the machines for processing.. Explain the operation process.		Identify the major processing machines. Operate the machines to carry out processing of crops into consumable products such as cassava	Guide the trainee to identify and operate the machines for processing.	Crop processing machines.
General Objective: 2.0 Know the major crops processing machines.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
3 - 7	2.1 Describe the use of major processing machines.	Explain the use of the machine for processing		Identify the major processing machines.	Guide the trainee to identify and operation the machines for processing.	Crop processing machines.
8 - 9	Describe the operation process of the machines.	Explain the operation process.		Carry out processing of crops into consumable products such as cassava using machines.		

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General Objectives: 3.0 Know the methods of storage of field processed crops products.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
10	3.1 Describe the end product of the processing of grains, tubers, legumes, spices, etc.	Explain the end products to the trainee		Identify the end products and categories and classify them according to their uses.	Guide trainee to carry out the task.	
11	3.2 Describe the methods of storage of field processed produce.	Explain the methods.		Store planting material.	Guide the trainee.	
12	3.3. Describe methods of storing planting material.					

Programme: National Vocational Certificate In Agriculture.
Module: VA E 223, Nursery Techniques
Duration: 40 Hours (1 Hour Theory, 3 Hours practical).
Unit 3.0

Goals: This module is designed to provide the trainee with the basic knowledge and skill of nursery techniques.

General Objectives:

1. Understand the techniques of nursing plant.
2. Know the methods of seed collection, storage and procurement.
3. Understand nursery operations record keeping and marketing of nursery seedlings.

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	Course: Nursery Technique	Course Code: VAE 223		Credit Hours: 3 hours/week		
				Theoretical: 1 hours/week		
	Year:	Pre-requisite:		Practical: 3 hours /week		
	Theoretical Content			Practical Content		
	General Objective 1.0: Understanding the techniques of nursery plant					
Week	Specific Learning Outcomes	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
	<p>1.1 Define Nursery</p> <p>1.2 State the condition for the choice of nursery site.</p> <p>1.3 Explain pre-nursing practices, nursery practices.</p> <p>1.4 Identify the types of tools and equipment used in the nursery.</p> <p>1.5 Describe how a seedling tray should be.</p> <p>1.6 Explain in details how to take care of seedling at pre-nursery and nursery site.</p>	<p>Explain to the trainee the pre-nursery and nursery practices.</p> <p>List out the tools and equipment to the trainee.</p> <p>Explain how the tray is.</p> <p>Describe ways of tending. Operation.</p>	<p>Watering can, Hand trowel, Hand fork shovel etc.</p>	<p>Draw the nursery tools listed in 1.4.</p> <p>Construct a seedling tray and fill it with soil.</p> <p>Carry out tending operation.</p>	<p>Guide the trainee to draw.</p> <p>Demonstrate to the trainee how to create a seedling tray. Guide trainee on how to plant and cater for seedling.</p>	<p>Watering cans, hand trowel, hand fork, shovel.</p> <p>Seeds Tray Soil Seeds</p>

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						Water fertilizer
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General Objective 2.0: Know the methods of seed collections procurement and storage						
2.1	Describe methods of seed collection extraction and storage.	- Explain to the trainee how to collect and extract seeds.		Collect, extract and store seeds.	Demonstrate how to extract and store seed.	Seeds
2.2	Describe seed testing methods.	- Explain the viability and germination		Test seed viability and germination.	Demonstrate the procedure to the trainee.	Seeds
2.3	Explain seed dormancy.	- Explain seed dormancy. List cases of seed dormancy.		Carry out the methods of breaking seed dormancy.		
2.4	Describe the methods of breaking seed dormancy	- Explain the Dormancy of various tree seeds.		Perform the act of procuring different types of seeds.		Seeds
2.5	Describe the various methods of seed procurement.	- Explain how to procure and store seeds collected from the forest abroad etc.				Seeds
2.6	Describe the various methods of seed storage such as cold storage, dry storage etc..			Store seeds using different methods.	Store seeds using different methods.	Fridge bins seeds.
General Objective 3.0: Understand nursery operation record keeping and marketing						
3.1	Keep nursery records calendar .register.	Explain to the trainee how to keep record.	Calculate, Register etc.	Keep records of nursery operations in a register and calendar.	Guide the trainee to achieve the task.	

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	3.2 Market nursery seedlings.			Market nursery seedlings and record sales.	Guide the trainee to achieve the task.	
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PROGRAMME: National Vocational Certificate in Agriculture

Module: VAE 224 Planting and Weeding Techniques

Unit: 3.0

Duration: 40 hours (1 hour theory, 3 hours practical)

Goals: This module is designed to provide the trainee with the basic knowledge and skill in weeding and planting techniques.

General Objectives:

- 1.0 Understand the practice of tillage
- 2.0 Understand the different methods of propagation.
- 3.0 Know the methods of weed control in crops.

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PROGRAMME: National Vocational Certificate In Agriculture.						
COURSE: Planting and Weeding Techniques.			COURSE CODE: VAE 224		CONTACT HOURS: 40 hours	
GOAL: This module is designed to provide the trainee with the knowledge and skill in weeding and planting techniques.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
	General Objective: 1.0: Understand the practice of tillage					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Define tillage and various methods of tillage. 1.2 State the objectives of tillage. 1.3 Carry out tillage operations in the field.	Explain the process of tillage and the methods stating their objectives		Carry out tillage operations such as manual and mechanical.	Demonstrate the process to the trainee.	Tractors with implement hoes, ridgers, mattocks.
	General Objective: 2.0: Understand the different methods of propagation.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Describe asexual propagation 2.2 State the differences between asexual and sexual propagation 2.3 Compare the differences	Explain the terms to the trainee with their differences. Explain their differences. Explain the quality				

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	<p>of the methods.</p> <p>2.4 Determine the quality of planting materials.</p> <p>2.5 Describe the various planting methods such as</p> <ul style="list-style-type: none"> - in situ - drilling - dibbling <p>Broadcasting</p> <p>2.6 Define supply and thinning and determine when to supply or thin.</p>	<p>of planting materials.</p> <p>Explain the methods.</p> <p>Explain the terms to the trainee.</p>	<p>Charts</p>	<p>Carry out planting operation in the field using the methods.</p> <p>Supply seeds or seedlings and carry out thinning operation in the farm.</p>	<p>Demonstrate the process to the trainee.</p> <p>Demonstrate the processes to the trainee.</p>	<p>Planting implements.</p> <p>Seeds seedlings.</p>
COURSE SPECIFICATION: Theoretical Contents:						
General Objective: 3.0: Know the methods of weed control in crops.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	<p>3.1 Define and classify weeds.</p> <p>3.2 Describe the effect of weeds on growing crops.</p> <p>3.3 Describe how weeds can be controlled.</p>	<p>Explain the term and their classification procedure.</p> <p>Explain the effects of weed on crop development.</p> <p>Explain the control processes of weeds</p> <ul style="list-style-type: none"> - Mechanical - Chemical and their effect on crops. 		<p>Collect weeds identify and classify them and keep them in an album or plant presses.</p> <p>Measure the effect of weed in crop farm.</p> <p>Identify the different types of herbicides in use and apply them in the farm.</p>	<p>Guide the trainee to carry out the classification and keeping.</p> <p>Guide the trainee to carry out the task.</p> <p>Demonstrate the processes of applying herbicides in the farm</p> <ul style="list-style-type: none"> - Demonstrate the process of mechanical weeding in 	<p>Weed album plant press.</p> <p>Herbicides</p> <p>Hoe Mattocks Mower</p>

					the farm - By hoe - Weeder - Mower.	weeder
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Programme: National Vocational Certificate In Agriculture
Module: VAE 225 Tractor Operation and Implements.
Duration: 50 hours (1 hour theory,, 4 hours practical)
Units: 3.0

Goal: This module is designed to provide the trainee with the skill and knowledge in tractor and implements operations.

General Objectives

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

1. Understand the road traffic laws and regulations
2. Know major tractor parts
3. Know the routine check on a tractor
4. Know how to drive a tractor
5. Know tractor implements and maintenance

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PROGRAMME: National Vocational Certificate In Agriculture.						
COURSE: Tractor Operation and Implements			COURSE CODE: VAE 225		CONTACT HOURS: 50 hours	
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in tractor and implements operations.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
	General Objective 1.0 Understand the road laws and regulations			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 List road traffic laws and regulations	Discuss road traffic signs and regulations		Identify the Nigerian and international high way codes Identify road signs and signals and road markings	Guide the trainee	
	General Objective: 2.0 Know major tractor parts					
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 List the names of the major parts concern with tractor, driving steering, starting button, gear levers, clutch pedals brakes)	Explain the parts to the trainee.		Identify the major parts concern	Guide the trainee	Tractor parts.
	General Objective: 3.0 Know the routine check on a tractor					
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	3.1 List the routine daily check on the tractor(oil	Describe the process		Carry out a routine check on a tractor	Guide the trainee	

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	level, water level, fuel level, tyre pressure, battery					
	3.2 Identify the specifications contain in a tractor manual and other in formations	Describe the process				
	3.3 Distinguish between service manual, service record book and a log book	Describe the process		Identify service manual, service record book and a log book. Enter appropriate records in the books	Guide the trainee	
	3.4					
General Objective: 4.0 Know how to drive a tractor						
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	4.1 Explain the procedures for starting diesel and petrol engines 4.2			Start a tractor on test run and stop it. <ul style="list-style-type: none"> - Put the tractor on for - Ward motion - Reverse the tractor - Make left and right hand turning - Practice tractor driving on the high way and do same on road traffic - Identify the 3 – point linkage system - Couple a mounted on a tractor implement to the tractor linkages - Raise and lower the 	Provide guidance and directives to the trainee	

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				<ul style="list-style-type: none"> - mounted implement using hydraulic level - Drive the tractor with implement on best guided - Lower and dismantle the implement - Couple a trail implement to a tractor - Drive the tractor with the implement forward and reverse direction - Prepare for a driving test - Obtain driving license 		
General Objective: 5.0 Know implements and maintenance						
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	5.1 Identify the various tractor Implements <ul style="list-style-type: none"> - Harrows - Ploughs - Ridges etc 	Describe the implements		Recognise the implements and use them on a tractor Carry out routine maintenance of the implements above	Guide the trainee	

PROGRAMME **NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.**

COURSE: **VAE 226 AGRICULTURAL IMPLEMENTS AND MACHINE MAINTAINANCE II**

DURATION: **40 HOURS (1HOUR THEORY , 3 HOURS PRACTICAL)**

UNIT: **3.0**

GOAL: This module is designed to provide the trainee with the knowledge to identify, use, maintain and repair different farm implements and machines.

General Objectives:

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

1. Understand the working principles and maintain different types of mowers.
2. Understand the working principles and maintain different types of forage harvesting equipment.
3. Understand the operating principles of balers and bale collectors and be able to maintain them.
4. Understand the operational principle of harvesting and handling equipment and be able to maintain them.
- 4.0 Understand the working principle of dairy machine and be able to maintain them.

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: AGRICULTURAL MACHINES AND IMPLEMENT MAINTENANCE II				COURSE CODE: VAE 226	CONTACT HOURS: 40 HOURS	
GOAL: This module is designed to provide the trainee with the knowledge to identify, use, maintain and repair different farm implements and machines.						
COURSE SPECIFICATION: Theoretical Contents: 1 HOUR				Practical Contents: 3 HOURS		
General Objective: 1.0 Understand the working principles and maintain different types of mowers.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Identify different types of mowers. 1.2 State the working principle of the three common types of mowers e.g. reciprocating (cutter bar) flail and rotary etc.	Explain different types of mowers Explain the working principle	Manual			

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	1,3 Describe the main parts of the mower	Explain the main parts	Sketches Diagram	Identify the parts of gear box, cutter bar, flail, knife assembly and pitman.	Guide the trainee to identify the different parts in a mower.	Gear box Knife etc.
	1.4 Describe the sharpening and working tools of a mower	Explain each of them	Sketches Diagram	Sharpen knife section, flail disc remove and replace damaged or worn parts.	Disassemble and guide trainee in replacing parts.	Angle grinders files spanners etc
	1.5 Describe the routine maintenance and adjustment of mower	Explain how to maintain and adjust mowers	Maintenan ce Manual	Carry out routine maintenance and adjustments of mowers	Demonstrate to the trainee how to carry out routine maintenance of mowers	Mower, geese, tool box
	1.6 Describe the various parts of mower 1.7	Explain the parts	Diagram	Make a line diagram to show the various parts	Guide trainee in making the diagram to show parts.	Diagram
General Objective: 2.0 Understand the working principles and maintain different types forage harvesting equipment						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Explain the working principles of forage harvesters	Illustrate with diagrams.	Different charts, diagrams of harvesters.		Guide students to identify parts of forage harvester	Forage harvester
	2.2 Describe forage harvester	Explain the working principles of forage harvester		Identify types and parts of Forage harvesters.		Harvesting equipment
	2.3 Describe the main parts of	Explain each part	Diagram	Operate forage harvesters.	Show students	Knife assembly,

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	forage harvester		Sketches		how to operate harvesters.	
	2.4 Describe the maintenance of forage harvester	Explain maintenance procedure	Maintenance manual	Repair and adjust knife assembly, conveyor, chutes, shear plate, reflectors and gear box.	Demonstrate to trainee how to repair and adjust knife assembly, conveyor chutes, shear plate, reflector and gear box.	conveyor chutes, shear plate reflectors and gear box.
	2.5 Describe faulty operations in harvesters .	Explain the faulty operations	Maintenance manual	Diagnose and correct faulty operation of harvesters	Carry out diagnosis of faulty machine	Uncouple parts of faulty machine.

General Objective: 3.0 Understand the operational principles of balers and bale collectors and be able to maintain them.

WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	3.1 Explain the working Principles of balers.	Describe the working principles of balers.	Baling machines	Identify parts of bales.	Show to the trainee the different parts of bales	Demonstrated parts of balers.
	3.2 Describe the operation of baling machine.	Explain operations of a baler	Baling machines	Operate a baler.	demonstrate to trainee the operation of balers	Baling machine
	3.3 Describe the	Explain the maintenance	Manual	Repair and adjust pick up mechanism, packer	Carry out the report and	Baling machine.

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	<p>maintenance and adjustment of balers and bale collectors</p> <p>3.4 Describe the maintenance of balers and bale collectors</p>	<p>adjustment procedure</p> <p>Explain the maintenance procedure</p>	<p>Maintenance manual</p>	<p>assembly, rain assembly, knife section shear plates and tipping mechanism</p> <p>Diagnose and correct faulty operation of machine</p>	<p>adjustment of the items listed in 3.4</p> <p>Undertake the diagnosis of a faulty machine.</p>	<p>Uncoupled engine parts of faulty baling machines.</p>
General Objective: 4.0 Understand the operating principle of harvesting and handling machine.						
WEEK	Specific Learning Objective	Teachers Actives	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	<p>4.1 Explain the working principles of the main components of a combine harvester potato digger, cotton picker, groundnut lifter and other root crop harvesters.</p> <p>4.2 Describe the operational adjustment of harvesters listed in 4.1</p> <p>4.3 Describe the routine maintenance of harvesters listed in 4.1</p> <p>4.4 Describe the general repair of</p>	<p>Describe the working principle of the items listed in 4.1</p> <p>Explain the procedure.</p> <p>Explain the routine maintenance</p> <p>Explain the general repairs.</p>	<ul style="list-style-type: none"> • combine harvester • potato digger • cotton picker • G/nut lifter etc. <p>Maintenance manual.</p> <p>Machine manual.</p>	<p>Operate and make the necessary adjustment on all the harvester listed in 4.1</p> <p>Carry out routine maintenance on all the harvesters.</p> <p>Repair or replace worn or damaged parts of</p>	<p>Demonstrate to the trainee the operation and adjustments of the machines listed in 4.1</p> <p>Under take the maintenance of all harvesters in group to maintain harvester</p> <p>Demonstrate to students the repair and</p>	<p>All the harvesters listed in 4.1</p> <p>Harvester listed in 4.1</p>

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	harvesters in 4.1			harvesters.	replacement of worn or damaged parts of harvester. Ask students in group to do the same.	Harvesters listed in 4.1
General Objective: 5.0 Understand the working principle of dairy machines and be able to maintain them.						
WEEK	Specific Learning Objective	Teachers Actives	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	5.1 Explain the operational principle of dairy machine	Describe to the trainee the principles of dairy machine	<ul style="list-style-type: none"> • Dairy machine • Milk cream • Milk parlous • Storage machine Diagram.	Identify types and parts of dairy machines.	Guide the trainee to identify the parts.	Dairy machines
	5.2 Describe the following:Dairy mchine, milking machine, cream separator, and cooling machine.	Explain the maintenance procedure.		Operate dairy machine, Milking machine, Cream separator, Cooling machine.	Guide students on how to operate all the machines listed in 5.2	Milking machine Cream separator. Cooling machine.
	5.3 Describe the service and maintenance of dairy machines.	Explain the maintenance procedure.	Service and maintenance manual.	Service and maintain dairy machine	Demonstrate how to service and maintain dairy machines	All the dairy machines listed in 5.2.

Program: National Vocational Certificate In Agriculture.

Module: VAE 311 Bee Keeping

Duration: 50 hours (1 hour theory,, 4 hours practical)

Units: 3.0

Goal: This module is designed to provide the trainee with the basic knowledge and skill on Bee keeping processing

General Objectives

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

1. Know bee keeping and its values
2. Understand the bee keeping process
3. Understand the management of bee hives

PROGRAMME: National Vocation Certificate In Agriculture						
COURSE: Bee Keeping			COURSE CODE: VAE 311		CONTACT HOURS: 50 hours	
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in bee keeping farming						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective 1.0 Know bee keeping and its values				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Describe bee keeping and its values to the economic development	Explain and discuss its values to the trainee				
	1.2 Describe the composition of the bee colony - Queen	Explain the meaning of the terms				

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	<ul style="list-style-type: none"> - Worker - Drones <p>1.3 Describe the characteristics of honey bee</p> <ul style="list-style-type: none"> - Swarm - Behaviour and migration - Colony - Honey comb - Brood nest - <p>1.4 Explain the food requirement of honey bees</p> <ul style="list-style-type: none"> - Floral trees need <p>1.5 Describe the traditional bee keeping practice in Nigeria</p> <ul style="list-style-type: none"> - Pot hives - Basket hives - Roiled up and hives - Strew hives - Hallow trunk hives <p>1.6 Describe the basic principles of the above processes</p>					
	General Objective: 2.0 Understand the bee keeping process					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources

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	<p>2.1 Describe the comb building</p> <p>2.2 Explain hiving a swam process</p> <p>2.3 Describe the feeds/ feeding handling of bees</p> <p>2.4 Describe the bee keeping equipment and tools</p> <ul style="list-style-type: none"> - Box hive - Moveable - Frame hives - Suitable local hives - Sitting hives - Shades - Smoker <p>Tools:-</p> <ul style="list-style-type: none"> - Bee gloves - Bee hat Boots - Hive tools <p>2.5 Explain the choice of a site</p> <p>2.6 Describe the construction of different hives</p>	<p>Explain the terms to the trainee</p> <p>Explain the equipment and tools</p> <p>Describe the process of selecting an idle site for keeping hives</p> <p>Explain the process</p>		<p>Identify the various bee keeping equipment and tools</p> <p>Keep hives in an idle site</p> <p>Couple various types of hives</p>	<p>Describe the identification procedure</p> <p>Guide the trainee to carry out the task.</p>	<p>Carpentry tools.</p>
General Objective: 3.0 Understand the management of bee hives						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	<p>3.1 Describe the following management practices</p> <ul style="list-style-type: none"> - Natural development of a bee colony - Seasonal management - Hive type - Honey extraction 	<p>Describe the pest and diseases to the trainee</p>				

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	<ul style="list-style-type: none"> - Production of bee wax - Collection of pollen 					
	3.2 Explain the pest and diseases of honey bee	Describe the pest and diseases to the trainee		Identify major pest and diseases of honey bee, an album for the pests and record the diseases	Guide the trainee to carry out the test	
	3.3 Describe the harvesting handling and processing of honey bee products	Explain the processes to the trainee		Carry out the harvesting handling and processing of honey bee products	Guide the trainee to carry out the test	
	3.4 Describe the various products of honey bee			Prepare the various products		
	<ul style="list-style-type: none"> - Bee wax - Bee pollen - Honey - Bee bread - Jelly 				Guide the trainee	
	3.5 Describe the marketing process of the	Explain the processes		Market honey products in the market		
	<ul style="list-style-type: none"> - Primary honey products - Derived products 					

PROGRAMME: National Vocational Certificate In Agriculture.

MODULE: VAE 312 Sheep and Goat Production

DURATION: 50 Hours (1 Hour theory, 4 Hours practical)

UNIT: 3.0

GOALS: This module is designed to provide the trainee with the basic knowledge and skill on Sheep and Goat Production.

GENERAL OBJECTIVES:

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

1. Know the purpose of sheep and goat rearing in Nigeria such as meat and milk production.
2. Know the important breed of sheep and goat in Nigeria.
3. Understand the breeding systems in sheep and goat production.
4. Know the housing need of sheep and goat.
5. Understand the nutritional requirement of sheep and goat.
6. Understand the health and disease problem of sheep and goat.

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE .						
COURSE: SHEEP AND GOAT PRODUCTION		COURSE CODE: VAE 312		CONTACT HOURS: 50 HOURS		
GOAL: This module is designed to enable the trainee acquire the knowledge and skill on sheep production.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0 Know the purpose of sheep and goat rearing in Nigeria.				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-2	1.1 State the economic importance of sheep and goat rearing to the animal meat intake of Nigerians. 1.2 Evaluate the nutritional value of sheep and goat meat and milk. 1.3 State the economic uses of sheep and goat by products;	Discuss the importance with the trainee. Explain the nutritional values. Describe the economic uses of				

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	- skin - droppings	sheep skin, droppings, horn, etc.				
	General Objective 2.0 Know the important breeds of sheep and goat in Nigeria.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
3-4	2.1 Identify the various breeds of sheep and goat. 2.2 Describe the physical/characteristics of the breeds mentioned in 2.1. 2.3 Describe the distribution and adaptation of sheep and goat in Nigeria. 2.4 Classify sheep and goat into meat type, milk type dual purposes type.	Describe the various breeds to the trainee. Explain the physical characteristics of the breeds Discuss the distribution and adaptation of sheep and goat in Nigeria. Explain the classification to the trainee.	Breeds charts Breed charts Maps charts Breed charts	Identify the various breeds of sheep and goat and classify them according to their distribution and adaptation.	Guide the trainee to identify the breeds	Breed charts
3.0	General Objective 3.0 Understand the Breeding Systems in Sheep and goat production					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
5-6	3.1 Explain the factors considered in the selection of livestock e.g. twining, milkiness, rapid-live weight-gain, etc. 3.2 Describe the desirable characteristics of a male and female sheep and goat sought for breeding. 3.3 Carryout selection process for quality sheep and goat 3.4 Explain the effect of pure breeding in breeding and cross breeding on the performance of sheep and goat.	Discuss the factors with the trainee Explain the characteristics Explain the selection process Describe the effect to the trainee	 Sketches	Select a quality sheep and goat	Guide the trainee to carryout the selection.	Sheep and goat population Live sheep and goat

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7-8	<p>3.5 Explain the reaction of sheep and goat to photo period.</p> <p>3.6 Explain the following terms: - Age at puberty - Oestrous cycle - Signs of heat - Age at first service - Mating ratio and mating method</p> <p>3.7 Describe the care and management of a pregnant sheep and goat.</p> <p>3.8 Describe the care and management of a young sheep and goat.</p> <p>3.9 Describe the management of an adult sheep and goat.</p>	<p>Describe the process of photo periodism to the trainee.</p> <p>Discuss the terms with the trainee.</p> <p>Explain the process to the trainee.</p> <p>Explain the process</p> <p>Explain the process</p>		<p>Monitor the reaction of sheep and goat photoperiod</p> <p>Observe and monitor the process in the farm</p> <p>Manage a pregnant ewe and doe in the farm to delivery stage</p> <p>Take care of a lamb and kid in the farm, observe its development and keep record of the development</p>	<p>Guide the trainee to monitor the process.</p> <p>Guide the trainee to carryout the process.</p> <p>Guide the trainee to monitor the task.</p> <p>Guide the trainee to monitor the task.</p>	<p>Live sheep and goat</p> <p>Pregnant ewes and does.</p> <p>Does Lambs, kids</p>
General Objective 4.0 Know the housing need for sheep and goat.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
8	4.1 Describe the design of sheep and goat houses and relate them to climatic conditions and space requirement.	Describe the equipment.	Models			
9	4.2 List the equipment needed for rearing sheep and goat.	Describe the equipment.	Models	Identify the equipment at the farm and draw them.	Guide the trainee to carryout the assignment	Sketches diagrams feeders drinkers crate etc
General Objective 5.0 Understand the nutritional requirement of sheep and goat.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources

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10	5.1 Describe the digestive systems of Sheep and goat	Explain the digestive system and process of digestion in sheep and goat.	Models.	Draw the digestive system of sheep and goat.	Guide the trainee to draw the digestive system	Sketches diagrams
12	5.2 List the various types of grasses and legumes used for feeding sheep and goat.	Describe the grasses and legumes.		Identify the grasses and legumes.	Guide the trainees	Grasses legumes
	5.3 State the nutrients requirement of sheep and goat.	Explain the nutrient requirement to the trainee.	Feed requirement tables		Guide the trainees	Grazing land
	5.4 Explain grazing and grazing systems, zero grazing, rotational grazing, etc.	Describe the types of grazing listed 5.4		Carry out grazing of sheep and goat in the field.	Grazing land to graze the animals	Sheep, goat
	5.5 State the daily feed allowance and daily water requirement of sheep and goat.	Explain the daily feed allowance requirement of sheep and goat		Calculate the daily feed allowance and water intake of sheep and goat.	Guide the trainee	
	5.6 Identify the symptoms of nutritional diseases of sheep and goat.	Describe the symptoms.		Analyse the symptoms of nutritional diseases from a sick sheep and goat.	Guide the trainee to analyze the symptoms	Sick sheep and goat.
6.0	General Objective 6.0 Understand the health and disease problems of sheep and goat.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
12	6.1 Identify signs of ill health in sheep and goat.	Describe the signs.	Charts	Identify a sick sheep and goat in the farm and record the diseases.	Guide the trainee to identify and record the disease.	Sick sheep and goat.
	6.2 List the common diseases in sheep and goat.	Describe the signs.	Chart	Identify disease symptoms for sick	Guide the trainee to	Sick sheep and goat.

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	6.3 Identify the symptoms and control measure of common diseases in sheep and goat.	Describe the symptoms and the measures of control.	Charts	sheep and goat and treat them. Record the treatments carried out.	identify and treat Guide the trainee to treat and record	Sick sheep and goats drugs etc
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PROGRAMME: National Vocational Certificate In Agriculture

MODULE: VAE 313 Farm Record Keeping

DURATION: 50 HOURS (1HOUR THEORY, 4 HOURS PRACTICAL)

UNIT: 4.0

GOALS: This module is designed to provide the trainee with the basic knowledge and skill in Farm Record Keeping.

GENERAL OBJECTIVES:

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

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1. Understand record keeping
2. Understand the designing and keeping of farm records.
3. Know lettering design and construction of teaching aid.

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE .						
COURSE: FARM RECORD KEEPING			COURSE CODE: VAE 313		CONTACT HOURS: 50 HOURS.	
GOAL: This module is designed to provide the trainee with the skill and knowledge in Farm Record Keeping.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
1.0	General Objective: Understand Record Keeping.			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-2	1.1 State the importance of farm record. 1.2 State the main records kept in the farm.	- Explain the importance to the trainee.				
2.0	General Objective Understand the designing and keeping of farm records.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources

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3-4	2.1 State the appropriate records to be kept for both early season and late season vegetable enterprise.	Explain the appropriate records in 2.1		Design appropriate records to be kept for both early and late season vegetable enterprise	Guide the trainee to carryout the task.	
5-7	2.2 Explain the appropriate records on cultivated vegetables, cereals, pulses etc.	Explain the appropriate record in 2.2		Maintain appropriate records on cultivated vegetables, cereals, pulses, etc.	Guide the trainee to carryout the task	Farm records.
	2.3 Explain farm record and determine the cost of production, revenue and profit.	Analyse farm records.		Analyse farm record and determine the cost of production, revenue and profit.	Guide the trainee to analyse farm records	
8-9	2.4 State the appropriate records to be kept in goat and sheep farm.	Explain and analyse the various records in 2.4		Design an appropriate record to be kept in a , goat farm, goat and sheep farm, etc and analyse the record to determine the cost revenue and profit.	Guide the trainee on the task...	
3.0	General Objective Know lettering design and construction of teaching aids.					
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
10-12	3.1 State the importance of lettering designs and teaching aid.	Explain the terms appropriately, stating their importance to agriculture.				
	3.2 Describe sign writing	Explain the process of sign writing.		Identify the steps and precautions in sign writing. Cut templates of alphabets using	Demonstrate steps and procedures	Drawing materials.

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	3.3 State the templates of alphabets.	Explain the templates of alphabets		cardboard Design and produce sign posts, posters, flipcharts, flashcards, etc.	Guide the trainee on the task..	Cardboards blades etc.
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Programme: National Vocational Certificate In Agriculture.
Module: VAE 314 Dairy Processing
Duration: 60 hours (2 hours theory,, 4 hours practical)
Units: 3.0

Goal: This module is designed to provide the trainee with the knowledge and skill in dairy processing

General Objectives

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

1. Know the significance of milk and dairy to human
2. Understand the handling and processing of milk

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PROGRAMME: National Vocation Certificate In Agriculture.						
COURSE: Dairy Processing			COURSE CODE: VAE 314		CONTACT HOURS: 60 hours (2 HOURS THEORY, 4 HOURS PRACTICAL)	
GOAL: This module is designed to provide the trainee with the skill and knowledge in dairy processing						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
	General Objective 1.0 Know the significance of milk and dairy to human			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Describe milk and its products 1.2 Describe the significance of milk and milk products as food	Explain the terms to the trainee		Identify milk and the different milk products	Guide the trainee	Milk

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General Objective: 2.0 Understand the handling and processes of milk						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	2.1 Describe the milking process	Explain the milking process to the trainee	Charts	Milk a cow using various milking techniques	Guide the trainee	Cow
	2.2 Describe the factors that affect the quantity and quality of milk, such as hygiene	Explain the hygiene process involved in handling milk		Carry out the cleaning and disinfection of items and utensils used in handling milk	Guide the trainee	Milking utensils
	2.3 Explain the processing of milk	Describe the processing techniques such as cooling, saving by fermentation, creaming		Process milk by <ul style="list-style-type: none"> - Cooling - Sowing - Creaming - Heating 	Guide the trainee to carry out the task	Milk
	2.4 Explain the products made from milk	Describe the products such as: <ul style="list-style-type: none"> - Cream - Butter - Sour milk - Butter milk - Ghee - Yoghurt - Ice fir 		Make the following products from milk sample: cream, butter, sour milk, butter milk, ghee, yoghurt, ice fir.	Guide the trainee to make the products	
	2.5 Describe milk production record	Explain the process of record keeping in dairy preparation		Prepare a record of dairy production	Guide the trainee to accomplish it	
	2.6 Describe the	Explain the process		Carry out the marketing of	Guide the trainee to	

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	marketing process of dairy products	to the trainee		dairy product	carry out the marketing	
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Programme: National Vocational Certificate in Agriculture.

Module: BSB 321, Ecology

Duration: 30 hours (1 hour theory, 2 hours practical)

Unit: 2.0

Goal: This module is designed to introduce the trainee to the concept of ecology

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

- 1.0 Define ecology, ecological association and ecosystem
- 2.0 Understand the basic structures of microorganisms and disease of man

3.0 Know the various forms of pollution of water, air and land

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE.						
COURSE: Ecology			COURSE CODE: BSB 321		CONTACT HOURS: 30 hours (1 hour theory, 2 hours practical)	
GOAL: This module is designed to introduce the trainee to the concept of ecology						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0 Understand the basic concepts in ecology				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Define ecology, ecological association and eco system.	Explain the ecological terms: Population, Succession, niche food chains, food web, parasitism symbiosis				

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	<p>1.2 Differentiate between aquatic and terrestrial habitants.</p> <p>1.3 Define population</p> <p>1.4 Describe the various ecological apparatus and equipment for population studies</p>	<p>commensalisms etc</p> <p>Explain the ecological functions affecting the distribution of organisms in an environment: biotic factors a biotic factors</p> <p>Explain significance of population regulation</p> <p>Explain guardant, insect net, plan ton net</p>				
General Objective: 2.0 Understand the basis structure of microorganisms and diseases of man						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	<p>2.1 Describe the structure of bacteria and virus</p> <p>2.2 Identify the structure of bacteria and virus.</p> <p>2.3 Differentiate between the various morphological forms of</p>	<p>Explain the structure of bacteria and virus</p> <p>Draw the structure of bacteria and virus.</p> <p>Explain the various morphological form</p>		<p>Observe and draw bacteria under the microscope</p>	<p>Guide the trainee to observe and draw structure of bacteria under the microscope</p>	<p>Microscope</p>

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	<p>bacteria</p> <p>2.4 List the difference between bacteria cell, a viral cell and a rickettsial cell</p> <p>2.5 Explain the causative organisms, mode of transmission, symptoms, control and prevention of diseases.</p> <p>2.6 Explain the importance of vaccination and inoculation in the control/prevention of diseases</p> <p>2.7 Describe the process of vaccination and inoculation.</p>	<p>of bacteria</p> <p>Describe the differences between bacteria and virus</p> <p>List out the diseases, the causative agent, mode of transmission, symptoms, control measures and prevention.</p> <p>Discuss vaccination and inoculation</p>		<p>Identify the causative organisms, mode of transmission, symptoms, control and prevention of diseases</p> <p>Identify the causative organisms mode of transmission symptoms, control/prevention of other non-bacterial/viral disease such as malaria, river blindness etc</p>	<p>Guide the trainee to identify.</p> <p>Guide the trainee to identify the causative organisms symptoms, control/prevention etc</p>	
<p>General Objective: 3.0 Know the various forms of pollution of water, air and land</p>						

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	<p>3.1 Distinguish between water, air and land Pollution</p> <p>3.2 Explain the source of environmental pollution.</p> <p>3.3 Describe the various forms of pollution of water, air and land.</p> <p>3.4 Describe the effects of the various pollutions mentioned in 3..3 above</p> <p>3.5 State the control measures for the various forms of pollution</p>	<p>Explain the distinction between water, air and land pollution</p> <p>List out the sources of environmental pollution.</p> <p>Explain the various forms of pollution.</p> <p>Explain the effects of pollution</p> <p>Explain the control measures necessary to prevent pollution</p>		<p>Identify the source of environmental pollution</p> <p>Identify the various forms of pollution of water, air and land e.g. detergent crude oil, sewage etc. Carry out trio to industrial areas to observe various forms of pollutions</p>	<p>Guide the trainee in the identification</p> <p>Guide the trainee to identify different types of pollution.</p> <p>Guide the trainee at the industrial areas to observe forms of pollutions</p>	<p>•</p>
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Programme: National Vocational Certificate In Agriculture.

Module: VAE 321 Snail Farming

Duration: 30 hours (1 hour theory,2 hours practical)

Units: 2.0

Goal: This module is designed to provide practical skills to enable the trainee set up small scale snail farming

General Objectives

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

1. Know snail and its biology
2. Know the economic values of snail
3. Understand the process of snail farming
4. Know the breeding and management of snail
5. know the marketing process of snail

PROGRAMME: National Vocational Certificate In Agriculture.						
COURSE: Snail Farming			COURSE CODE: VAE 321		CONTACT HOURS: 30 hours	
GOAL: This module is designed to provide the trainee with the skill and knowledge of small scale snail farming						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective 1.0 Know snail and its biology				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Describe the general morphological characteristics of snail	Discuss the general morphology of snail <ul style="list-style-type: none"> - head - ventral and muscular foot - visceral hump 		Draw a snail and label it's morphological parts	Guide the trainee to draw and label	Live snail Charts

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	<p>1.2 Explain the general classification of the edible snail</p> <p>1.3 Explain the natural history of the class of snail</p> <ul style="list-style-type: none"> - Size and appearance - Abundance and distribution - Functions - Lifecycle 	<ul style="list-style-type: none"> - mantle or pallium <p>Discuss the general classification of the edible snail in an organogram format</p> <p>Discuss the natural history of snail such as:-</p> <ul style="list-style-type: none"> -It's size and appearance abundance Distribution Form and functions <ul style="list-style-type: none"> - shell - locomotion - coiling and tension - lifecycle etc 		<p>Draw the organogram classification of the snail</p>	<p>Guide the trainee to draw</p>	<p>Chart</p>
	<p>1.4 Describe the suitable snail species for farming</p>	<p>Explain the various snail species suitable for farming</p>		<p>Identify the suitable snail species for farming</p>	<p>Guide the trainee to identify</p>	<p>Charts Live snails</p>
<p>General Objective: 2.0 Know the economic values of snail</p>						
	<p>2.1 Describe the economic value of snail farming in Nigeria</p> <p>2.2 Explain the importance of snail meat to the food and nutritional status of Nigerians</p>	<p>Discuss the economic values with the trainee</p> <p>State the importance and contribution of snail to the meat need of Nigerians and its nutritional and medicinal value</p>				

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	<p>2.3 Explain the importance of snail as an industrial raw Material</p> <ul style="list-style-type: none"> - Shell - Saliva 	<p>Discuss the industrial uses of snail parts</p> <ul style="list-style-type: none"> - shell - saliva <p>in Ceramic and pharmaceutical industries</p>				
General Objective: 3.0 Understand the process of snail farming.						
	<p>3.1 Explain the factors to consider in selecting a site for snail farming</p> <ul style="list-style-type: none"> - Soil characteristics - Temperature and humidity 	<p>Discuss the various factors with the trainee</p>				
	<p>3.2 Describe the different types of snail pens</p> <ul style="list-style-type: none"> - Hutch boxes - Trench pens - Mini-paddock pens - Moveable pens - Free range pens 	<p>Explain the types of pens</p>		<p>Construct the types of snail pens, hutch boxes, trench pens ,mini-paddock pens, moveable pens and free range pens</p>	<p>Guide the trainee to carry out the construction</p>	
	<p>3.3 Explain the food requirement and feeding habit of snail</p>	<p>Describe the types of food required by snail</p>		<p>Identify the foods of snail</p> <ul style="list-style-type: none"> - Green leaves - Tubers - Fruits - Flowers\ etc 	<p>Guide the trainee to identify</p>	<p>Samples of leaves, tubers, fruits, flowers, etc</p>
	<p>3.4 Describe the recommended diet of snail</p>	<p>Explain the recommended diet</p>		<p>Prepare a recommended diet for snail</p>	<p>Guide the trainee to prepare the diet</p>	
General Objective: 4.0 Know the breeding and management of snail						

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	<p>4.1 Explain the aestivation period of snail.</p> <p>4.2 Explain Pre-spawning phase Spawning phase Post- spawning phase</p> <p>4.3 Describe the collection process of snail</p> <ul style="list-style-type: none"> - From forest - Market - Period of collection <p>4.4 Describe the attributes of a breeding stock</p> <p>4.5 Describe the following terms in snail breeding</p> <ul style="list-style-type: none"> - Fecundity - Hatchability - Establishment rate - Growth <p>4.6 explain rearing density in snail rearing</p> <p>4.7 Describe the nursery practices in snail rearing</p>	<p>Discuss the aestivation of snail</p> <p>Discuss the spawning process to the trainee</p> <p>Discuss the various collection process etc</p> <p>Explain the terms to the trainee</p> <p>Discuss the term to the trainee</p> <p>Explain the nursery practice to the trainee</p>		<p>Identify the spawning periods of snail</p> <p>Collect snails from the forest and market at different periods of the day and record</p> <p>Carryout nursery practices such as</p> <ul style="list-style-type: none"> - Keeping of breeding stock - Egg laying 	<p>Guide the trainee to identify</p> <p>Guide the trainee to collect</p>	
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	<p>4.8 Explain the effect of</p> <ul style="list-style-type: none"> - High density - Low density <p>In snail rearing</p> <p>4.9 Describe the management calendar of snail farming</p> <p>4.10 Explain the importance of the management calendar to snail farming</p> <p>4.11 Describe the predators, pest and diseases of snail</p> <p>4.12 Describe the control measures of pest predators and diseases of snail</p>	<p>Discuss the terms to the trainee</p> <p>Discuss the management process</p> <p>Discuss the importance of the snail farming</p> <p>Explain the predators pest and diseases of snail</p> <p>Explain the control measures</p>		<ul style="list-style-type: none"> - Egg collection - Egg hatching - Tending of the baby snail <p>Rear snail at high density and low density and record the effects</p> <p>Develop a management calendar for a snail farm and record</p> <p>Identify the predators pest and disease of snail at the farm</p> <p>Carry out the control of predator, pest and disease of snail at the farm</p>	<p>Guide the trainee to carry out the task</p> <p>Guide the trainee to carry out the task</p> <p>Guide the trainee to carry out the task</p>	
General Objective: 5.0 Know the marketing process of snail						
	<p>5.1 Describe the transportation process of snail</p> <p>5.2 Describe the types of snail market</p>	<p>Discuss the process with the trainee</p> <p>Explain the types of markets to the trainee</p>		<p>Package snail and transport to the market, house from the farm</p> <p>Identify a snail market</p> <ul style="list-style-type: none"> - Carry out the marketing of snail at 	<p>Guide the trainee to carry out the task</p> <p>Guide the trainee to carry out the task</p>	<p>Packaging materials, Bicycles, motorcycles lorries</p>

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	<ul style="list-style-type: none">- Local markets- Export market			<ul style="list-style-type: none">- the market- Record the sale in the record book		
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Programme: National Vocational Certificate In Agriculture.

Module: VAE 322 Mushroom Productions

Duration: 30 hours (1 hour theory,,2 hours practical)

Units: 2.0

Goal: This module is designed to provide practical skills in mushroom farming

General Objectives

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

1. Know the mushroom and its biology
2. Know spawn and its production
3. Know the growing of mushroom

PROGRAMME: National Vocation Certificate In Agriculture						
COURSE: Mushroom cultivation			COURSE CODE: VAE 322		CONTACT HOURS: 30 hours	
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in mushroom cultivation						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective 1.0 Know mushroom and its biology				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Describe mushroom, the fungus ecology and the life cycle	Discuss mushroom as a fungus describing its ecology and life cycle				

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	1.2 Explain the temperature ranges for cultivation of mushrooms	Describe the temperature requirements of cultivating mushroom				
	1.3 Describe mushroom farm layout and hygiene.	Explain the farm structure and its hygiene		Construct a mushroom farm taking note of its structures and hygiene	Guide the trainee to carry out the construction	
	2.1 Describe spawn	Explain spawn and its production.				
	2.2 Explain the production of spawn					
	2.3 Explain starter culture, sterilization process	Describe the preparation of starter culture and the sterilization process		Prepare cultures and carry out the sterilization process	Guide the trainee to carry out the processes	Cultures
	2.4 Describe the preparation of cultures, preparation, media, and preparation of slants.	Explain the preparation process		Prepare cultures media, and slants.		
	2.5 Describe the mother spawn and the preparation of final spawn	Explain mother spawn and the preparation process		Prepare final spawn		
	General Objective: 3.0 Know the growing process of mushroom					
	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	3.1 Describe substrate for growing mushroom and compare properties	Explain the growing substrate and their properties		Identify substrates with their properties preparation and prepare them for growth	Guide the trainee to carry out the identification and preparation	

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	3.2 Describe the properties of substrates	State the properties of substrates				
	3.3 Describe the preparation of a substrate for a good mycelia growth	Explain the propagation process of a supplement location.				
	3.4 Describe the fruiting and harvesting of a spawn	Explain the processes		Identify the fruiting of spawn and carry out its harvesting	Guide the trainee to carry out the test	
	3.5 Identify the pests and diseases of spawn	Explain the diseases and pest		Identify the various pest and diseases of spawns and draw them, stating their control process	Guide the trainee to carry out the test	
	3.6 Describe the post harvest handling process of spawn, such as - Fresh market - Drying	Discuss the processes with the trainee		Carry out the fresh market and drying of harvested spawn	Guide the trainee	

Programme: National Vocational Certificate In Agriculture

Module: Poultry Production

Course Code: VAE 323

Course Duration: 50 hours (1 theory, 4 hours practical)

Course Unit: 3.0

Goal: The module is designed to provide the trainee with the basic knowledge and skill in poultry production business..

General Objectives:

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

- 1.0 Know the different breeds of poultry.
- 2.0 Know the principles of poultry production.
- 3.0 Know poultry housing and construction.
- 4.0 Understand basic health management practices in poultry business.
- 5.0 Understand the system of egg grading.
- 6.0 Understand the process of bird dressing.
- 7.0 Understand record keeping and marketing of poultry products.

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE		
COURSE: POULTRY PRODUCTION	COURSE CODE: VAE 323	CONTACT HOURS: 50 HOURS
GOAL: This module is designed to provide the trainee with the basic knowledge and skill in small scale poultry production business.		
COURSE SPECIFICATION: Theoretical Contents:		Practical Contents:
1.0	General Objective: Know the different Breeds of Poultry.	

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WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	<p>1.1 Identify different breeds of poultry in Nigeria.</p> <p>1.2 Differentiate between different breeds of poultry in Nigeria</p> <p>1.3 Described the importance of the poultry breeds described above.</p>	<p>Describe the different breeds of poultry to the trainee.</p> <p>Explain to the trainee the importance of different breeds to the agriculture.</p>	<p>Different live poultry breeds and charts.</p> <p>Live poultry birds.</p>	<p>Carryout the identification and classification of different breeds of poultry birds available in Nigeria.</p> <p>Carryout the identification and classification of the poultry birds.</p>	<p>Explain to the trainee the identification and classification procedure and direct the student to carry our the task</p> <p>Guide the trainee to identify and classify the different breeds.</p>	<p>Different live poultry birds.</p>
2.0	General Objective: 2.0 Know the Principles of Poultry Production.					
	<p>2.1 Identify the hybrids used for production of table birds and egg.</p> <p>2.2 Described systems of commercial egg production. Such as battery, cages, deep litter.</p>	<p>Explain to the trainee the identification of table birds and egg.</p> <p>Explain to the trainee the production technique of battery egg production, cage production and deep liter.</p>	<ul style="list-style-type: none"> - live bird - egg charts - Battery - cage, - deep litter 	<p>Carryout the identification of table birds and egg.</p> <p>Carryout egg production in battery, deep litter.</p>	<p>Demonstrate to the trainee the identification procedure of table bird and table egg.</p> <p>Demonstrate the procedure to the trainee.</p>	<p>Live table bird, live table egg.</p> <p>Poultry farm.</p>

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	2.3 State the advantages of battery, litter and deep litter egg production.	List out the advantages and disadvantages.	- Cage - Battery - Deep litter			
3.0	General Objective: 3.0 Know Poultry Housing and Construction					
	3.1 Explain the environmental factors considered in building a poultry house of heat, moisture and ventilation.	Describe the factors in detail to the trainee.	Constructed poultry house.	Construct a poultry house taking into consideration the heat, ventilation and moisture.	Guide the student to carryout the construction.	Building materials.
	3.2 Describe important considerations in poultry house construction such as foundation, floors, roofs, walls etc.	List out the consideration to the trainee.	Constructed poultry house.	Construct a poultry house taken into consideration the foundation, floor, wall and roof.	Guide the student to carryout the construction.	Building materials.
	3.3 Determine adequate structure and space for a known number of birds.	Described the determination and design for the structure and space for 500, 1000, 2000 etc of birds.	Poultry houses accommodating 500, 1000, 2000 number of birds.	Design and construct a poultry house structure and space to accommodate 500, 1000, 2000 birds.	Guide the trainee to accomplish the task.	Building materials.
	3.4 Design adequate structure and space for a known number of birds.					

WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
4.0	General Objective: Know Poultry Management Practices.					
	4.1 Define: - Sexing	Explain to the trainee the importance of the	Live chickens.	Carryout the sexing, caponizing,	Guide the trainee to	Live chickens

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	<ul style="list-style-type: none"> - Caponising - Delousing - Debeaking - Culling <p>In poultry management.</p>	practices to the poultry industry.		delousing, debeaking and culling of poultry birds.	carryout the exercise.	
5.0	General Objective: Understand Basic Health Management Practices in Poultry Business.					
	<p>5.1 Describe the following processes:</p> <ul style="list-style-type: none"> - Vaccination - Deworming 	Explain the processes to the trainee.	<ul style="list-style-type: none"> - Syringes - Drugs - Sick bird 	Carryout the vaccination and deworming of poultry birds.	Guide the trainee to carryout the task.	Syringes Drugs Sickbirds
	5.2 Describe Caponisation method.	Explain the procedure of caponisation to the trainee.		Carryout caponisation practice at the poultry farm.	Guide the student to carryout the task.	
	5.3 Describe diseases in poultry (nutritional and parasitic)	Discuss the disease both nutritional and parasitic and poultry birds.	<ul style="list-style-type: none"> - Disease - Poultry bird 	<p>Identify the symptoms of diseases in poultry.</p> <p>Identify ecto and endo parasite in poultry.</p>	Describe the identification process to the students.	<p>Disease Poultry Birds</p> <p>Disease Poultry Birds</p>

WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	5.4 Describe the preventive and control measures for ecto and endo parasites.	Explain the preventive and control measures to the trainee.		Identify birds with endo and ecto parasite infection.	Guide the trainee to carryout the identification.	Disease Poultry Bird
				Carryout the	Guide the	Disease

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	5.5 Define prophylaxis.	Explain and discuss the process to the trainee.		treatment of infected birds.	trainee to carryout the treatment.	Poultry Bird
	5.6 Define vaccine.	Explain vaccines and types of vaccines in poultry to the trainee.	Vaccines	Identify method of prophylactic measures in poultry such as sanitation, vaccination.	Guide the trainee to carry out sanitation and vaccination in a poultry farm.	Poultry farm
	5.7 List types of vaccines in poultry.					
	5.8 Describe the uses of the vaccines in 5.7 above	Describe the vaccines required by poultry to the trainee.	Vaccines	Carry out vaccination program.	Guide the trainee to carryout the task.	Vaccines syringes fridges.
	5.9 Identify all necessary vaccines required by poultry.			Stored vaccines to maintain viability.		
	5.10 Explain the value of antibiotics, store drugs.	Describe the value of antibiotics and stored drugs to poultry.	Drugs	Identify sources of poultry drugs.	Guide the trainee to identify the drugs.	Drugs.
6.0	General Objective: Understand the system of Egg Grading.					
	6.1 Describe types of poultry egg grades.	Explain the grading process to the trainee.	Poultry eggs.	Sort out poultry eggs into different grades using mechanical and visual/manual grader.	Guide the trainee to operate the graders to sort out the eggs according to	Poultry eggs Mechanical grader Manual grader.

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					grades.	
7.0	General Objective: Understand the Process of Bird Dressing					
	7.1 Describe all the processes involved in bird dressing from slaughtering to evisceration and packing.	Explain the processes involved in chicken dressing in detail to the trainee.		Dress chicken	Guide the trainee to dress a chicken after slaughtering.	Live Chicken knife
	7.2 Explain the importance of cleanliness during processing.	Described the cleanliness procedure during slaughtering.				
8.0	General Objective: Understand Record Keeping and Marketing of Poultry					
	8.1 Explain the importance of record keeping in poultry industry.	Describe the importance of record keeping in poultry industry and the types of records.	Log book Record board	Prepare a record book and carry out recording of records.	Guide the trainee to carry out the task.	Log book Record board
	8.2 List the types of records to be kept in poultry business.		Egg Live chicken Dress chicken	Carryout the marketing of poultry egg and bird.	Guide the trainee to achieve the task.	Poultry Egg Chicken Dress chicken.
	8.3 Identify a suitable market for poultry egg, bird and dress bird.	Explain the marketing process of poultry egg and bird to the trainee.				

Programme: National Vocational Certificate In Agriculture.

Module: VAE 324 Orchard Practice and Maintenance.

Duration: 40 Hours (1 Hour theory, 3 Hours practical).

Unit 3.0

Goals: This module is designed to enable the trainee acquire the skill and knowledge to establish and maintain an orchard.

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General Objectives:

1. Know the principles and techniques of orchard establishment and maintenance.
2. Know the principles and practice of cultivating fruit.
3. Understand the symptoms of diseases, pest and deficiencies of orchard.
4. Know the harvesting techniques and marketing of fruits.

	Course: Orchard Practice and Maintenance	Course Code: VAE 324		Credit Hours: 3 hours/week		
				Theoretical: 1 hour/week		
	Year:	Pre-requisite:		Practical: 3 hours /week		
	Theoretical Content			Practical Content		
	General Objective 1.0: Know the principles and practice of cultivating fruit					
Week	Specific Learning Outcomes	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Identify economic fruit trees and list their botanical names. 1.2 Describe the growth requirement	- Explain the identification procedure to the trainee. - Discuss the growth		Identify fruit of economic importance and classify them.	Describe the procedure to the trainee.	

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	of the identified fruits. 1.3 Describe the cultural practices involved in the production of the fruits listed above. 1.4	requirement with the students. - Explain the cultural practices to the trainee.		Carry out cultural operations in an orchard farm such as watering, weeding, planting etc.	Describe the procedure to the trainee.	
General Objective 2.0: Know the principles and techniques of orchard establishment and maintenance						
2	2.1 Describe pruning and its objectives. 2.2 Describe the various method of pruning. 2.3 Describe shading and its objectives. 2.4 Describe mulching and its objectives. 2.5 List the material used for mulching. 2.6 List the advantages and disadvantages of mulching.	- Explain the method and procedure of pruning, shading, mulching with their advantages and disadvantages.		Carry out pruning shading, mulching etc. indicating their advantages and disadvantages to orchard maintenance.	Guide the trainee to carry out the task.	Shears, pruning knife dry grasses hoes mattocks etc.
General Objective 3.0: Understand the Symptoms of diseases, pest and deficiencies of orchard						
3	3.1 Describe the symptoms of diseases associated with orchard and fruits. 3.2 Describe the symptoms of pest associated with orchard and fruit.	- Explain the processes to the trainee.	Charts	Identify and collect samples from an orchard. Identify and collect pest infested samples	Guide the trainee to carry out the task.	

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	3.3 Describe the symptoms of mineral deficiencies associated with orchard.			from an orchard. Identify and collect deficiency samples from an orchard.		
General Objective 4.0: Know the harvesting techniques and marketing of fruit						
4	4.1 Describe the harvesting methods of fruits.	- Explain the processes to the trainee.	Charts	Carry out harvesting of fruits in an orchard.	Guide the trainee to carry out the activity.	
	4.2 Describe the post harvesting handling process of fruits.	- Explain the processes to the trainee.	Charts			
	4.3 Explain the marketing process of fruits.	- Describe the marketing processes.		Carry out marketing of fruits.	Guide the trainee to market fruits.	

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE: IN AGRICULTURE

MODULE VAE 325 Farm Pest Management

DURATION: 30 Hours (1 hour theory, 2 hours practical)

UNIT: 3.0

Goal: This module is designed to provide the trainee with the knowledge and skill in farm Pest Management practices.

General Objectives:

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

1. Know the different types of farm pests and diseases
2. Know the damages done to crops.
3. Know prevention and control methods.
4. Know farm sanitation practices.

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: Farm Pest Management			COURSE CODE: VAE 325		CONTACT HOURS: 30 Hrs	
GOAL: This module is designed to provide the trainee with the knowledge and skill in Farm Pest Management practices.						
COURSE SPECIFICATION: Theoretical Contents: 1 HOUR				Practical Contents: 2HOURS		
	General Objective: 1.0 Know the different types of farm pests and diseases			General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1 – 2	1.1 Identify different types of farm pests.	Explain to the trainee different types of farm pest	Models such as charts	Capture farm pests at the farm and identity them.	Demonstrate the procedure to carry out the identification	Insect nets, traps.

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3 – 4	1.2 Identify disease symptoms of crops.	Describe the different disease symptoms of crops	Crops disease pests Modules such as charts	Collect and identify different disease infected crop materials at the farm and laboratory.	and classification of the pests. Demonstrate to the trainee the procedure of carrying out the task.	Hand lens microscope
General Objective: 2.0 Know the symptoms and damages done to crops						
5	2.1 Describe the damages done to crops by pest.	Explain to the trainee the damages done to crops by pest.	Damage crop parts, charts	Identify damage crops by pest and classify them.	Guide the trainee to identify and classify the damages according to the pest.	Farm crops
6	2.2 Describe the damages done to crops by disease infection.	Explain to the trainee the different damages done to crops by disease infection.	Infected crop parts.	Identify the disease infected crops at the farm and laboratory.	Explain the procedure of collecting and identifying disease crops.	Lens, microscope
General Objective: 3.0 Know prevention and control methods.						
7 – 8	3.1 Describe the prevention methods of crops damage, such as monitoring, forecasting, exclusion, cultural, mechanical, and physical.	Explain to the trainee the methods of preventions.	Charts	Carryout forecasting and monitoring of diseases and pest infected crops farms.	Explain to the trainee the forecasting and monitoring procedure at the farm.	Disease and pest infected farm.
9				Carry out exclusion, cultural physical and mechanical control of pest and disease infection at the farm.	Demonstrate to the trainee the procedure of carrying out the task.	- Infected farm ; - - uninfected farm.
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
9 – 10	3.2 Describe chemical	Explain to the	Sample of	Identify and apply different	Describe to the	- Herbicide

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11 – 12	control of pest and diseases of crops. 3.3 Describe farm sanitation and hygiene	trainee the different chemicals used in disease and pest infected farm.	control chemicals such as herbicides, pesticides Chemical samples	chemical control to pest and disease infected Farm. Carry out farm sanitation at the farm.	trainee the control procedure Describe to the trainee the sanitation procedure at the farm.	<ul style="list-style-type: none"> - Pesticides - Sprayers - Water <ul style="list-style-type: none"> -Fences showers Foot baths Hand gloves Rubber boots Cover all
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Program	:	National Vocational Certificate In Agriculture
Module	:	VAE 326, Agricultural Storage Structures.
Duration	:	40 hours (1 hour lecture, 3 hour practical)
Unit	:	3.0
Goal	:	This module is designed to provide the trainee with the basic knowledge and skill in crop storage techniques.

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

- 1.0 Know the different types of stored crop product.
- 2.0 Know the different storage systems.
- 3.0 Know the types of storage for crops.
- 4.0 Know the storage process and keeping quality.

NVC in Agriculture (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE						
COURSE: Agricultural Storage Structure			COURSE CODE: VAE 326		CONTACT HOURS: 40 (1HOUR THEORY, 3 HOURS LECTURE)	
GOAL: This module is designed to provide the trainee with the basic knowledge and skills in crop storage technique.						
COURSE SPECIFICATION: Theoretical Contents: 1 hr				Practical Contents: 3 hrs		
General Objective: 1.0 Know the different types of stored crop production				General Objective:		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-2	1.1 Describe the different types of stored crop products such as dried products, perishable products etc. 1.2 Describe the nature of dried and perishable crops produce 1.3 Describe the procedures of preserving dried crop produce. 1.4 Describe the procedures for preserving perishable crop product	<ul style="list-style-type: none"> • Explain tthe different types of products such as dried-grains, perishable – vegetables. Explain the nature. Explain the procedure.	<ul style="list-style-type: none"> • Crop produce 	1.1 Carry out the classification of stored crop produce according to the following conditions. - Dried - Perishable	<ul style="list-style-type: none"> • Guide the trainee to carry out the classification. 	<ul style="list-style-type: none"> • Grains, Vegetables

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	General Objective: 2.0 Know the different storage systems.			General Objective:		
3	<p>2.1 Describe the different storage systems such as traditional and modern.</p> <p>2.2 State the advantages and disadvantages of the system.</p> <p>2.3 Describe the ecological zones where the structures are used</p> <p>2.4 State the reasons for the choice of the structures in ecological zones.</p>	<p>Explain the different systems their merit and demerit.</p> <p>List out the advantages and disadvantages.</p> <p>Explain the ecological zones.</p> <p>List out the reasons.</p>		<p>2.2 Identify the traditional and modern traditional storage systems.</p>	<ul style="list-style-type: none"> • Explain and guide the trainee to carry out the classification 	<p>Charts</p> <p>Drawings</p>
	General Objective: 3.0 Know the type of storage systems.			General Objective:		
4-6	<p>3.1 Describe the storage facilities according to the followings:</p> <ul style="list-style-type: none"> - traditional such as rhombus barns, cribs sacks ,hermatic Modern silos,freezers,fridges. 	<p>Explain the types of storage and their construction procedures.</p>	<p>Charts</p>	<p>3.1 Carry out the construction of the traditional and modern storage structures.</p>	<p>Guide the trainer to achieve the task.</p>	<ul style="list-style-type: none"> • Construction materials. • Sacks Bags • Warehouse/Store • Cold rooms • Deep Freezer • Fridges

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	<p>3.2 Identify the facilities mentioned 3.1 above</p> <p>3.3 Describe the procedures of constructing the structures in 3.1 above</p> <p>3.4 Describe the methods of arrangement of crop produce in each structure mentioned in 3.1</p>	<p>List out the facilities.</p> <p>Explain the procedures.</p> <p>Explain the methods of arrangement.</p>			<p>Arrange crops produce in the structures mention in 3.1 above.</p>	<p>Guide the trainee to carry out the arrangement.</p>	
<p>General Objective: 4.0 Know the storage process and keeping quality.</p>				<p>General Objective:</p>			
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources	
7-8	<p>4.1 Describe the methods of storing planting materials such as</p> <ul style="list-style-type: none"> - grains - tubers - vegetable 	<ul style="list-style-type: none"> • Explain the methods . 	<ul style="list-style-type: none"> • Charts 	4.1 Store planting materials.	<ul style="list-style-type: none"> • Show the procedures to the trainee. 	<ul style="list-style-type: none"> • Seeds • Tubers • Sacks • rhombus 	
8-9	<p>4.2 Describe the methods of storing food materials such as</p> <ul style="list-style-type: none"> - grain - tubers - Pulses 	<ul style="list-style-type: none"> • Explain the methods 	<ul style="list-style-type: none"> • Charts 	<p>4.2 Store food materials such as:</p> <ul style="list-style-type: none"> - grains - tubers - vegetables - fruits 	<ul style="list-style-type: none"> • Show the procedures to the trainee. 	<ul style="list-style-type: none"> • Sacks • rhombus 	
10-12	<p>4.3 Describe the quality preserving techniques in storage process such as:</p> <ul style="list-style-type: none"> - traditional - chemical 	<ul style="list-style-type: none"> • Explain the procedures. 	<ul style="list-style-type: none"> • 	<p>4.3 Store and preserve the quality of food in the following methods:</p> <p>traditional such as drying.</p> <ul style="list-style-type: none"> - Chemical such as pesticides, insecticides. 	<ul style="list-style-type: none"> • Guide the student to perform the activities. 	<ul style="list-style-type: none"> • Grains • Tubers • Pesticides • Insecticides 	

PROGRAMME: National Vocational Certificate In Agriculture

MODULE: VAE 327 Harvesting and Post harvesting Management

DURATION: 30 hours (1 hour, 2 hours practical)

UNITS: 3.0

GOAL: This module is designed to provide the trainee with the knowledge and skill in harvesting and post harvesting techniques.

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

- 1.0 Understand the practice of harvesting.
- 2.0 Understand the practice of produce handling.

NVC in Agriculture (Draft)

PROGRAMME: National Vocational Certificate .In Agriculture.						
COURSE: Harvesting and Post Harvest handling.			COURSE CODE: VAE 327		CONTACT HOURS: 30 hours	
GOAL: This module is designed to provide the trainee with the skill and knowledge in Harvesting and Post harvest handling.						
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0: Understand the practice of harvesting.						
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
	1.1 Define harvesting. 1.2 List the factors guiding harvesting time.	Explain harvesting methods and the factors guiding harvesting periods.		Identify harvesting tools and equipment. Carry out harvesting operations of a named field or tree crop by - manual - mechanical methods.	Demonstrate the processes to the trainee.	Threshers.
General Objective: 2.0: Understand the practice of produce handling.						
	2.1 Describe the nature of freshly harvested produce. 2.2 Describe the procedure for transporting harvested produce. 2.3 Describe the procedure for primary processing of freshly harvested produce. 2.4 Describe the procedure for preserving freshly harvested produce.	Explain the types of harvested produce and the procedure for transporting them. Explain the procedure to the trainee	Charts.	Identify agricultural produce preserving structures such as cribs, rhombus, barns, silos etc and preserve produce in them		Rhombus Silos Barn Cribs Freezers.

NATIONAL VOCATIONAL CERTIFICATE IN AGRICULTURE
MINIMUM LIST OF EQUIPMENT/ TOOLS REQUIRED

BIOLOGY LABORATORY:

S/NO	EQUIPMENT/ ITEMS.	QUANTITY
1	Balance Top loading balance analytical balance	8
2	Aquarium transparent plastic glass 60 x 30 x 30 cm	5
3	Crucible, Pore lain, , 43mm diameter with lid	2
4	Crucible tongs with bow, 15 cm	30
5	Dissector	30
6	Filte funnels, plastic, 6.5 cm diameter	4
7	Magnifiers hand lens, 7.5 diameter (or folding magnfier x 10)	10
8	Microscopes, light with x 10 wildield eyepiece and x4 (or x5), x1C, x 20 (or x 50) and x 100 objectives	30
9	Micro slide storage box, for 100 slides	30
10	Microtome, hand type	2
11	Dissecting kits	30
12	Dissecting boards (or trays with wax)	30
13	Nets (various types)	5

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14	Plant press	2
15	Thermometer – 5 to + 50oC x 0.1oC	30
16	Thermometer – 5 to 110oCx10C	30
17	PH meter	2
18	Heating mantle (with at least 5 burners)	1
19	Water distiller	2
20	Magnetic stirrer	2
21	Centrifuge (various types)	2
22	Spatula	30
23	Photosynthesis apparatus	2
24	Plant and animal tissues	5 of each type
35	Histological slides	5 of each type
36	Embryology slides	5 of each type
37	Animals and plants whole mount (for smaller plants and animals)	5 of each type
38	Charts of various organs and tissues	1
39	Blood and lymph circulation	1
40	Mammalian organs	1

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41	Models of human and animal and plant tissues and organs	1
42	Full size skeleton of man, rabbit, birds, snakes toads	1 each
43	Pieces of vertebrate bone	1 set
44	Preserved specimen	
45	Fish	1
46	Snakes	1
47	Mammalian foetus	1
48	Rabbits, rats	1
49	Mammalian organs – liver, kidney, brain, eye, ears	1 each
50	Sex organs etc	1 each
51	Worms	1
52	Birds	1
53	Dried insects	1
54	Molluses – Gastropod, bivalves and Cephalopods	1 each
55	Gas jar covers	30
56	Gas jar (different types)	10
57	Barrettes	30

58	Petri dishes	30
59	Pipettes graduated (different sizes)	50
60	Reagent bottles	100
61	Test tubes	200
62	Watch glass	50
63	Post Mortem kit	2
64	Stethoscope	1

ENGINE MAINTENANCE AND REPAIR TOOLS

Sets of open-end spanners-5mm-32mm

Big open-end spanners

Ring spanners- 6mm- 32mm

Sets of socket spanners – 6mm – 32

Pre-adjustable torque wrenches

Small, medium and big adjust spanners

Pipe wrenches (assorted sizes)

Vice grip wrench

Spark plug socket spanners

Sets of Allen keys (hexagon square)

Feeler gauges

Pressure gauges

Micrometer

Steel rule

Straight edge

Wing dividers

Scribers

Inside and outside calipers

Hydrometer

Set of clutch alignment gauge

Clutch set – screw gauge

Oil cans

Plug gauge

Ring gauge

Engineer's compass

Head pan

Vacuum tester

Timing light

Spark plug tester

Air compressor

Grease guns
Portable hoist
Hydraulic jack
Gear press
Large drills
Assorted grinders
Large drills and drill bits
Mechanic work bench
Power hacksaw
Engine stands
Creepers
Ramps
Dust bin
First aid box
Battery charging equipment
Set of pullers
Standby generator
Hydraulic press
Valve grinders
Wheel alignment gauge
Injector repair machine

Injector needle service kit

Carburetor service kit

Grease guns

Lathe machine

Ploughing tool

Finishing tool

Rounding tool

Right hand turning tool

Left hand turning tool

Screw thread cutting tool (internal & External)

Brass turning tool

Cutting off tool (parting tool)

Knurling tool

Chasing tool

MEASURING TOOLS

Inside caliper

Outside caliper

Micrometer gauge

Thread pitch gauge

Steel tape

Steel rule

Cutter bit gauge

Milling machine

Grinding wheel

Drilling machines

Storage cabinet

Tap and dies

Machine wrench

Oil stone

Punches

Hammer

Knock-out bar

Drill bits

Countersink bit

Centre head

Soluble oil

Oil can

Cooling tank

Lathe oil

Allen keys

Side table

Broom

SOLDERING EQUIPMENT

Blow torch

Soldering copper

Files

Tin snips

Soldering flux

Granulated soil ammoniac and water

Half and half solder

Acid – core wire solder

Resin – core wire solder

Emery cloth

Sand paper

Sheet metal shear

Cotton waste

Wire brush

Tong

Anvil

Mallet hammer

C. Clamp

Hacksaw

Marking gauge

Try square

Water bath

Dust bin

Leather gloves

Soldering table

Tower

GAS WELDING EQUIPMENT

Oxygen and acetylene bottle on a cart

Oxygen and acetylene regulators

Oxyacetylene welding cutting outfit

Oxygen and acetylene hoses

Welding goggles

Welding tips

Cylinder wrenches

Spark lighter

Welding rods

Welding fluxes

ARC. WELDING EQUIPMENT

Arc, welding (AC)

Electrodes (various types and sizes)

Electric grinder

Welding leather gloves

Arc. Welding helmet

Carbon arc touch

Wire brush

Chipping hammer

C. Clamp

Water bath

Clear goggles for shipping

Welding booths and screens

Power backsaw

Dressing wheels

Tong

Try-square

Vice

Hardie for anvil

Files

Dust bin

Electro-spot welder

Cold chisels

TRACTORS AND IMPLEMENTS

Tractors to be purchased of different sizes and makes. It is recommended that there should be a tractor and its accessory equipment to 10 students

Different sizes and make of tractors and trailers

Disc ploughs

Disc harrows

Spring time cultivators

Rotavators

Seed drills and planters

Inter-row weeders

Straddle row weeders

Knapsack sprayers

Tractor driven sprayers

Fertilizer applicators

Manure spreaders

Cutter bar mowers

Flail mowers

Double chopping forage harvesters

Flail forage harvesters

Hay balers

Combine harvester

Potato digger

Groundnut lifters

Yam and Cassava diggers

Petrol engine vehicles

RECOMMENDED TEXT BOOKS FOR AGRICULTURAL EQUIPMENT AND IMPLEMENT MECHANIC WORK.

S/NO	TITLE	AUTHOR
1	Basic farm machine	J.C. Turner
2	Basic farm machinery	Ship pen and Turner
3	Crop Production	H.T.Lovegrove
4	Gas Engines	Jones
5	Workshop practice	Greer and Howell
6	Principles of farm machinery	R. Kepner
7	Farm machinery management	H. Smith & L. Wilkes
8	Farm power & machinery management	D.Hurt
9	Fundamentals of service a) electrical systems b) Engines c) Hydraulics d) Welding e) Shop tools f) Tires and tracts	John Deere Publications (available also in

	g) Power training h) Bearings and seals i) Belts and chains j) Mowing and spraying k) Fuels lubricant and coolants	slides and films)
10	The Science of Animal Husbandry	J. Blakely & D. Bade
11	Working in Animal Science	D. Acker
12	Fundamentals of Machinery Operations (a) Crop chemicals (b) Preventive maintenance (c) Hay and Forage harvesting (d) Machinery managements (e) Combine harvesting (f) Agricultural machinery safety (g) tractors(h) Tillage (i) Planting	John Deere Publications

RECOMMENDATIONS FOR WORKSHOP FOR AGRICULTURAL EQUIPMENT AND IMPLEMENT MECHANIC MODULE.

1. Workshop Space

The workshop space should be large enough to accommodate and permit tree workshop space per students approximately 3m²/student.

The workshop should include a pit or ram for easy access to vehicles undercarriage.

The shop should be equipped with at least a workbench per student

ANIMAL TRACTION EQUIPMENT AND TOOLS

(a) Restraining materials

- Steel nose – ring or nylon nose – rope
- Screw driver (for nose ring)
- Steel puncher
- Casting rope (5 meters)

(b) Yokes

- Withers/shoulder yokes
- Horn/head yoke

(c) Animal Drawn Equipment

- Mould board plough
- Harrows
 - Spike tooth harrow
 - Spring tooth harrow
 - Disc harrow
- Ridgers:
 - Mouldboard ridgers
- Seed planter
- Weeder
- Groundnut lifters

- Carts
- Land levelers

Beekeeping Equipment and tools

(a) Equipment

- Lang troth hive
- Top bar (modern hive)
- Frame hives
- Suitable local hives
- Sitting hives
- Smoker

Tools

- bee gloves
- Bee hat
- Boots
- Hive tools

FISH FARMING, LIST OF EQUIPMENTAND TOOLS

1.0 SURVEYING EQUIPMENT

S/NO	TEM	QTY
1	Stereoscope	4
2	Prismatic	3
3	Ranging poles	8
4	Chain	2

5	Metric tape	2
6	Drawing	10
7	Protractors	10
8	Planimeters	1
9	Theodolite and staff	1
10	Scale rules	15
11	Set square	1 of 10
12	Set of arrows	30
13	Levels	4
14	T-square	10
15	Pantograh	10

2.0 GEAR AND CRAFT

S/NO	TEM	QTY
1	Working space	For 30
2	Model for Gillnets	1
3	Model for Trammel net	1
4	Model for Cast net	1
5	Model for Seine net	1
6	Model for Traps (various)	1 each
7	Model for Hooks and line	1
8	Model for Mid-water trawl	1
9	Model Purse seine	1
10	Model light fishing net	1
11	Model lift net	1
12	Netting materials	2 bundles each for 2" 3", 3 1/2,

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		4" and 5"
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S/NO	TEM	QTY
13.	Hooks packets	1 pkt of No: 1 to 20
14.	Nylon ropes	2 pkts each of No. 6, 8, 10 and 12
15.	Mounting twine	210D/3 to 210D/60

3.0 FISH FEED MILL

S/NO	TEM	QTY
1	Laboratory type grinding machine	2
2	Sieves	10
3	Mixer/blender	1
4	Refrigerators with freezer	2
5	Feed storage facility/store/packaging room	1
6	Earthworm breeding room	1
7	Pelleting machine	1

4.0 AQUACULTURE

S/NO	TEM	QTY
1	Hatchery troughs	6

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2	Air pumps and accessories	6
3	Secchi disc	5
4	pH meter	2
5	Portable field analysis kit	2
6	Ruttner water sampler	2
7	Eckmann grab	1
8	Portable Oxygen meter	2
9	Aerators	
10	Thermometer	10
11	Seine net	5
12	Sample bottles	10
13	Aquarium (various sizes)	5
14	MacDonald's Jar (for incubating egg)	
15	Chlorophyll (a) grinding motor (general purpose)	2
16	Incubator	1
17	Cell counting chamber	10
18	Ocular micrometer	10
19	Binocular	10

5.0 FISH PROCESSING EQUIPMENT

S/NO	ITEM	QTY
1	Cutting knives	30
2	Measuring boards	30
3	Weighing balance	2
4	Hand gloves	30
5	Freezers	5
6	Ovens	4
7	Kilns (different types)	5

8	Thermometers	10
9	Deep freezers	2
10	Fish drying racks	2
11	Fish boxes	10
12	Salting trays basins	10
13	Sun drying vats	10
14	Cold room	1

6.0 FISH MUSEUM

S/NO	ITEM	QTY	REMARKS
1	Aquaria Fish skeleton	10	Various types of all Nigeria Freshwater and as many as marine fish and animals
2	Preserved specimen		

7.0 FISH PONDS

S/NO	ITEM	QTY	REMARKS
1.	Concrete ponds	10	
2.	Earthen ponds	10	

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8.0 WORKSHOPS (BOAT BUILDING AND ENGINE MAINTENANCE ETCO

S/NO	ITEM	QTY
	Wood Workshop	
1	Band saw	1
2	Cross cutting circular saw	1
3	Surface planer	1
4	Thicknessing planer	1
5	Spindle moulding machine	1
6	Mortising machine	1
7	Drilling machine	1
8	Sanding machine	1
9	Simple platen processor	1
10	Grinding machine	1
11	Router	1
12	Wood chipper	1
13	Lathe (wood machine)	
14	Dimension sawing machine	
15	Hand tools: Saws, chisel, T-square, gauges, rule, screw drivers, a set of drill bit, hammer mallets, pincers, oil stones, planners etc	12
16.	First aid box	1
17.	Model boats	Assorted
18.	Model aquaria	Assorted

PEST CONTROL EQUIPMENT AND TOOLS

S/NO	ITEM	QTY
1	Magnifying glasses	15
2	Insect cages and cabinets	5
3	Specimen bottles	20
4	Insect nets	30
5	Lamps	10
6	Mist nets	10
7	Cool boxes	10
8	Knapsack pressure sprayer	2
9	Moterised mist spryer	1
10	Handy sprayer	5
11	Hand sprayer with container	5
12	Flood jet nozzles (1.5 ok)	4
13	Boom sprayer	2

NURSERY TOOLS AND Equipment

S/NO	ITEM	QTY
1	Watering system (spraying)	5
2	Seed sowers	5
3	Root pruners	5
4	Plant lifters	5
5	Plant weeders and ledgers	5
6	GHP Pump	3
7	Secatours	2
8	Planting hoes	10

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9	Spade	10
10	Pick axe	10
11	Pick axe	10
12	Hand trowel	10
13	Wheel barrows	10
14	Watering cans Head pans	10
15	Head pans	10
16.	Machetes	10
17.	Cutting knives	10

CROP STORAGE AND PROCESSING EQUIPMENT

S/NO	ITEM	QTY	REMARKS
1	Rice milling machine	1	Yam barns Rhombus refrigerated ware house
2	Rice thresher	1	
3	Rice parboil machine	1	
4	Groundnut desiccators	1	
5	Maize Sheller	1	
6	Hand oil press	1	
7	Grain drier	1	
8	Cassava grater	1	
9	Cassava peeler	1	
10	Silos	1	
11	Cribs	1	

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S/NO	ITEM	QTY
	Crop form (Teaching and Commercial)	1
	Nursery	
	Horticultural form	3
	Orchard	3

S/NO	ITEM	QTY
1	Crop form	
2	Tubers	
3	Cereals	3
4	Grains	20
5	Fertilizer store	1
6	Manure store	1
7	Implement store	1

Animal Farm (Teaching and Commercial)

S/NO	ITEM	QTY
1.	Poultry	
2.	Laying unit	1000
3.	Brooder unit	1000
4.	Deep litter	1000
5.	Hatchery	1
6.	Incubators	3
7.	Goat unit	80
8.	Sheep unit	80
9.	Rabbit	80
10.	Piggery	80
11.	Beef cattle	50
12.	Dairy cattle	50
13.	Milking parlour	1
14.	Slaughter house with slab	1
15.	Dip slab	1
	Hay pit	1

LIST OF PARTICIPANTS

S/No	Name Of Participant	Address
1.	Ayo-Enwerem Chibuzo M. (Mrs)	Department Of Animal Production, Michael Opara College Of Agriculture & Technology Umuagwu, Imo State
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8.	Engr. Dr. Nuru A Yakubu, OON	Executive Secretary, NBTE Kaduna
9.	Dr. M S Abubakar	Director of Programmes NBTE, Kaduna
10.	Mr. O E Okafo	HOD Agric. & Science, Division, NBTE, Kaduna
11.	Engr. A D K Muhammad	D O VEI/IEI, NBTE Kaduna
12.	Samaila Tanko	N.B.T.E Kaduna
13.	Binta Mohd Musa	N.B.T.E Kaduna