

**REPUBLIC OF KENYA**

**COMPETENCY-BASED MODULAR CURRICULUM**

**FOR**

**ANIMAL PRODUCTION TECHNOLOGY**

**LEVEL 6**

**PROGRAMME ISCED CODE: 0811 554 A**

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# FOREWORD

The provision of quality education and training is fundamental to the Government’s overall strategy for social and economic development. Quality education and training contribute to the achievement of Kenya’s development blueprint and sustainable development goals.

Reforms in the education sector are necessary to achieve Kenya Vision 2030 and meet the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution, and this resulted in the formulation of the Policy Framework for Reforming Education and Training in Kenya (Sessional Paper No. 14 of 2012). A key feature of this policy is the radical change in the design and delivery of TVET training. This policy document requires that training in TVET be competency-based, curriculum development be industry-led, certification be based on demonstration of competence, and the mode of delivery allow for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that this curriculum has been developed. For trainees to build their skills on foundational hands-on activities of the occupation, units of learning are grouped in modules. This has eliminated duplication of content and streamlined exemptions based on skills acquired as a trainee progresses in the up-skilling process, while at the same time allowing trainees to be employable in the shortest time possible through the acquisition of part qualifications.

It is my conviction that this curriculum will play a great role in developing competent human resources for the livestock production Sector’s growth and development.

**PRINCIPAL SECRETARY**

**STATE DEPARTMENT FOR TVET**

**MINISTRY OF EDUCATION**

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# PREFACE

Kenya Vision 2030 aims to transform Kenya into a newly industrializing middle-income country, providing high-quality life to all its citizens by the year 2030. Kenya intends to create globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through lifelong education and training. TVET has a responsibility to facilitate the process of inculcating knowledge, skills, and worker behaviour necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency-Based Education and Training (CBET).

TVET Act, CAP 210A and Sessional Paper No. 1 of 2019 on Reforming Education and Training in Kenya for Sustainable Development emphasized the need to reform curriculum development, assessment, and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry, as well as increase the global competitiveness of the Kenyan labour force.

This curriculum has been developed in adherence to the Kenya National Qualifications Framework and CBETA standards and guidelines. The curriculum is designed and organized into Units of Learning with Learning Outcomes, suggested delivery methods, learning resources, and methods of assessing the trainee’s achievement. In addition, the units of learning have been grouped in modules to concretize the skills acquisition process and streamline upskilling.

I am grateful to all expert trainers and everyone who played a role in translating the Occupational Standards into this competency-based modular curriculum.

# ACKNOWLEDGMENT

This curriculum has been designed for competency-based training and has independent units of learning that allow the trainee flexibility in entry and exit. In developing the curriculum, significant involvement and support were received from expert trainers, institutions and organizations.

I recognize with appreciation the role of the Agriculture Sector Skills Committee (NSSC) in ensuring that competencies required by the industry are addressed in the curriculum. I also thank all stakeholders in the livestock sector for their valuable input and everyone who participated in developing this curriculum.

I am convinced that this curriculum will go a long way in ensuring that individuals aspiring to work in the animal production Sector acquire competencies to perform their work more efficiently and effectively.

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# ABBREVIATIONS AND ACRONYMS

|  |  |
| --- | --- |
| PPEs | Personal Protective Equipment |
| ISCED | International Standard Classification of Education |
| TVET | Technical and vocational education and training |

# KEY TO ISCED UNIT CODE

Sector / Industry

Sub Sector

Occupational Area

Version Control

Unit of Competence Number

ISCED level, Programme Orientation and Level of Completion

xx

x

xxx

x

x

x

**CURICULUM OVERVIEW**

Animal Production Technology Level 6 qualification consists of competencies that an individual must have to enable him/her perform duties of an animal production technologist. It entails: livestock feed production, manage dairy cattle, manage beef animals, carry out sheep production, carry out goat production, carry out pig production, carry out poultry production, carry out rabbit production, carry out bee production, manage fish farm, manage draught animals, manage emerging livestock and companion animals.

This curriculum consists of basic, common and core units of learning as indicated below.

# SUMMARY OF UNITS OF COMPETENCY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ISCED Unit Code** | **Unit Title** | **Duration in Hours** | | **Credit Factors** |
| **MODULE 1** | | | | |
| 0811 351 15A | Livestock feeds production | 100 | | 10 |
| 0811 351 16A | Dairy Cattle management | 120 | | 12 |
| 0811 351 17A | Beef Animals management | 80 | | 8 |
| 0732 351 05 A | Farm structures | 100 | | 10 |
| **Total 1** | | | **400** | |
| **MODULE 2** | | | | |
| 0811 351 18A | Sheep Production | 80 | | 8 |
| 0811 351 19A | Goat Production | 80 | | 8 |
| 0811 351 20A | Pig Production | 100 | | 10 |
| 0811 351 21A | Poultry Production | 120 | | 12 |
| **Total 2** | | **380** | | **38** |
| **MODULE 3** | | | | |
| 0611 551 01 A | Digital Literacy | 40 | | 4 |
| 0031 551 02A | Communication Skills | 40 | | 4 |
| 0811 451 22A | Rabbit Production | 50 | | 5 |
| 0811 451 23A | Bee Production | 100 | | 10 |
| 0716 451 07A | Farm Machinery Operation | 100 | | 10 |
| **Total 3** | | **330** | | **33** |
| **MODULE 4** | | | | |
| 0417 541 03A | Work Ethics and Practices | 40 | | 4 |
| 0413 441 04A | Entrepreneurial Skills | 40 | | 4 |
| 0511 451 06 A | Animal Anatomy and Physiology | 100 | | 10 |
| 0831 451 24A | Fish farm management | 100 | | 10 |
| **Total 4** | | **280** | | **28** |
| **MODULE 5** | | | | |
| 0531 551 09A | Inorganic and Organic Chemistry | 120 | | 12 |
| 0811 551 12A | Soil Science Principles | 120 | | 12 |
| 0811 551 25A | Draught Animals | 80 | | 8 |
| 0811 551 26A | Emerging livestock and companion animals | 50 | | 5 |
| **Total 5** | | **370** | | **37** |
| **MODULE 6** | | | | |
| 0511 551 08 A | Genetic Concepts | 80 | | 8 |
| 0512 551 10A | Biochemistry Principles | 60 | | 6 |
| 0811 551 11A | Farm Management Principles | 60 | | 6 |
| 0532 551 13A | Geographic Information System | 40 | | 4 |
| 0111 551 14A | Scientific Research | 80 | | 8 |
| **Total 6** | | **320** | | **32** |
| **Sub total** | | 2080 | | 208 |
| **Industrial training** | | 480 | | 48 |
| **Grand total** | | 2560 | | 256 |

**Entry Requirements**

An individual entering this course should have any of the following minimum requirements:

1. Kenya Certificate of Secondary Education (KCSE) mean grade C- and above, KCE Division II1, KACE one(1) principal and one subsidiary or an equivalent qualification or certificate of Experiential learning or KNQF Level 5

**Or**

1. Animal Production Technology Level 5 qualification or its equivalent as determined by the Technical and Vocational Education and Training Authority (TVETA).

**Trainer qualification**

A trainer for any of the Units of Competency in this course MUST:

1. Have at least a minimum qualification of level 7 in Animal Production Technology or its equivalent.
2. Be licensed by TVETA

**Industry Training**

An individual enrolled in this course will be required to undergo Industry training for a minimum period of 480 hours in Livestock sector. The industrial training may be taken after completion of all units for those pursuing the full qualification or be distributed equally in each unit for those pursuing part qualification. In the case of dual training model, industrial training shall be as guided by the dual training policy.

**Assessment for levels 6**

The course shall be assessed formatively and summatively:

1. During formative assessment all performance criteria shall be assessed based on performance criteria weighting.
2. Number of formative assessments shall minimally be equal to the number of elements in a unit of competency.
3. During summative assessment basic and common units may be integrated in the core units or assessed as discrete units.
4. Theoretical and practical weighting for each unit of learning shall be as follows;
5. 10:90 for units in Module I & II
6. 30:70 for units in Module III & IV
7. 40:60 for units in Module V & VI
8. Formative and summative assessments shall be weighted at 60% and 40% respectively in the overall unit of learning score

For a candidate to be declared competent in a unit of competency, the candidate must meet the following conditions:

1. Obtained at least 40% in theory assessment in formative and summative assessments.
2. Obtained at least 60% in practical assessment in formative and summative assessment where applicable.
3. Obtained at least 50% in the weighted results between formative assessment and summative assessment where the former constitutes 60% and the latter 40% of the overall score.
4. Assessment performance rating for each unit of competency shall be as follows:

|  |  |
| --- | --- |
| **MARKS** | **COMPETENCE RATING** |
| 80 -100 | Attained Mastery |
| 65 - 79 | Proficient |
| 50 - 64 | Competent |
| 49 and below | Not Yet Competent |
| Y | Assessment Malpractice/irregularities |

1. Assessment for Recognition of Prior Learning (RPL) may lead to award of part and/or full qualification.

**Certification**

A candidate will be issued with a Certificate of Competency upon demonstration of competence in a Unit of Competency. To be issued with Kenya National TVET Certificate in animal production Level 6, the candidate must demonstrate competence in all the Units of Competency as given in the qualification pack. Statement of Attainment certificate may be awarded upon demonstration of competence in certifiable element within a unit.

These certificates will be issued by Qualification Awarding Institution.

# MODULE 1

# LIVESTOCK FEEDS PRODUCTION

**UNIT CODE:** 0811 351 15A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Produce Livestock Feeds

**Duration of Unit: 100 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to produce livestock feeds. It involves producing livestock forage, conserving livestock forage, and formulating livestock feed rations.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Produce livestock forage | 40 |
| 2. | Conserve livestock forage | 20 |
| 3. | Formulate livestock rations | 40 |
| **Total** | | **100** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Produce livestock forage | * 1. Forage production tools and equipment      1. Grass cutters      2. Generator      3. Water pump with hose      4. Tractors (optional)      5. Plough and harrow      6. Shovel      7. Hoe      8. Water sprinklers      9. Planter      10. Wheelbarro      11. Hole digger      12. Fencing materials   2. Propagation materials      1. Seeds      2. Seedlings      3. Cuttings      4. Splits      5. Tubers   3. Land preparation      1. Good Agricultural Practices (GAP)         1. Liming         2. Mulching   4. Establishing propagation materials      1. Direct sowing      2. Broadcasting      3. Transplant   5. Forage management      1. Pastures      2. Fodder crops   6. Harvesting of forage. | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 2.Conserve livestock forage | * 1. Quality assessment of forage   2. Conservation of forages      1. Silage      2. Hay   3. Storage of forage   4. Forage production record   5. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Formulate livestock rations | * 1. Feed formulation tools and equipment   2. Animal feeds ingredients      1. Feed additives,      2. Bran      3. Mineral premixes   3. Sourcing of animal feeds ingredients   4. Weighing of animal feed ingredients   5. Feed formulation methods      1. Pearson square      2. Trial and error      3. Computation method   6. Packaging and storage of formulated feeds   7. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | National Pig Development Programme Manual | | updated | 5 | | 1:5 | |
|  | Breeder’s manuals by breeders like Cobb and Issa Brown | | updated | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Forage farm | 1 | | 1 | | 1:25 | |
|  | machinery | Tractor, mowers  balers | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Wheelbarrow | Any model | | | 1 | | 1:25 |
|  | Scissors | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Hand drill | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Panga | Any five | | | 5 | | 1:5 |
|  | Measuring tape | Any five | | | 5 | | 1:5 |
|  | Spade | Any five | | | 5 | | 1:5 |
|  | String/line | Any five | | | 5 | | 1:5 |
|  | Surgical blades | In good condition | | | 5 | | 1:5 |
| **F** | **Specimens** |  | | |  | |  |
|  | forage | Rhodes grass, lucerne | | | 5each type | | 1:5 |

# DAIRY CATTLE MANAGEMENT

**UNIT CODE:** 0811 351 16A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Manage Dairy Cattle

**Duration of Unit: 120 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to manage dairy cattle which involves construction dairy cattle structures, feeding of dairy cattle, breeding of dairy cattle, managing of dairy calf, production of clean milk, performing dairy cattle routine management practices and marketing of dairy products

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Construct dairy cattle structures | 40 |
|  | Feed dairy cattle | 10 |
|  | Breed dairy cattle | 10 |
|  | Manage dairy calf | 20 |
|  | Produce clean milk | 10 |
|  | Perform dairy cattle routine management practices | 30 |
| **Total** | | **120** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| * + - 1. Construct dairy cattle structures | * 1. Dairy production tools and equipment      1. Milking machine      2. Milking parlor      3. Buckets   2. Site selection of dairy cattle structures      1. Crushes      2. Milking parlor      3. Barn      4. Feeding facility      5. Cattle shed      6. Cattle dips      7. Feed storage facility      8. Farm office   3. Designing of dairy cattle structures   4. Construction of dairy cattle structures   5. Maintenance of dairy cattle structures      1. Repairing      2. Cleaning      3. Dusting      4. creasing   6. Dairy structure maintenance records   7. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| * + - 1. Feed dairy cattle | * 1. Tools and equipment   2. Identification of dairy cattle feeds      1. Carbohydrates      2. Proteins      3. Vitamins      4. Minerals      5. Fats/ lipids      6. Water   3. Grouping of dairy cattle based on nutritional requirements      1. Young      2. Dry      3. Lactating      4. In calf      5. steers   4. Dairy cattle feeding regime   5. Feeding dairy cattle   6. Dairy feed intake evaluation.   7. Feed conversion efficiency evaluation   8. Dairy cattle feeding records   9. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| * + - 1. Breed dairy cattle | * 1. Breeding tools and equipment      1. AI Kit      2. Semen straws   2. Dairy cattle breeds      1. Friesian      2. Aryshire      3. Sahiwal      4. Jersey      5. Brown Swiss   3. Selection methods      1. Pedigree      2. Sibling      3. Family      4. Progeny   4. Heat signs in dairy cattle   5. Flushing   6. Breeding methods and technologies      1. Artificial insemination      2. Natural method      3. Cross breeding      4. Pure breeding      5. Inbreeding      6. Embryo transfer      7. Surrogate   7. Gestation management   8. Care of In-calf dairy cows   9. Steaming up   10. Parturition management   11. Breeding records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| * + - 1. Manage dairy calf | * 1. Calf management tools, equipment and materials   2. Preparing calf pen   3. Handling of calf at birth   4. Feeding calf on colostrum   5. Fostering of orphaned calves   6. Preparation of artificial colostrum   7. Calf identification      1. Ear tagging      2. Ear notching      3. Branding      4. Neck chains      5. Straps with numbers   Ear tattooing   * 1. Calf housing   2. Introduction of calf to roughage feeding   3. Disbudding of calf a and removal of extra mammary teats   4. Calf weighing   5. Monitoring of calf growth rate   6. Calf weaning   7. Management and disposal of waste | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| * + - 1. Produce clean milk | * 1. Milking materials and equipment      1. Cups      2. Herd Test Buckets      3. Thermometer      4. Separator   2. Assembling of milking cows   3. Restraining of milking cows   4. Cleaning and pre-dipping of udder   5. Carrying out of mastitis test      1. CMT      2. Strip cup   6. Stimulation of milk let down   7. Milking techniques      1. Hand milking      2. Milking machine   8. Milking   9. Disinfecting of udder hindquarters   10. Releasing of Milked cow   11. Sieving and weighing milk   12. Storage of milk and cooling   13. Maintenance of milk production records   14. Cleaning of milking equipment   15. Cleaning of milking parlor   16. Storage of re-usable materials   17. Management and disposal of waste | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 6. Perform dairy cattle routine management practices | * 1. Identification method      1. Ear tagging      2. Ear notching      3. Branding      4. Neck chains      5. Straps with numbers      6. Ear tattooing   2. Dehorning and disbudding of cattle   3. Trimming of overgrown hooves   4. Culling of dairy cattle   5. Control of external and internal parasites methods      1. Dipping      2. Bush clearing      3. Dusting      4. Spraying      5. Deworming      6. Drenching   6. Vaccination   7. Cattle isolation and quarantine to control notifiable diseases   8. Provision of clean water ad-libitum to dairy cattle | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 7. Market dairy cattle products | 7.1 Conducting market survey   * 1. Dairy cattle products      1. Milk      2. Hides      3. Hooves      4. Cream.      5. Butter.      6. Fermented.      7. Yogurt.      8. Cheese   2. Dairy cattle transportation   3. Maintenance of marketing records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | National Pig Development Programme Manual | | updated | 5 | | 1:5 | |
|  | Breeder’s manuals by breeders like Cobb and Issa Brown | | updated | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Drinkers | 1 | | 1 | | 1:25 | |
|  | Feeding trough | 1 | | 1 | | 1:25 | |
|  | Grass | 1 | | 1 | | 1:25 | |
|  | Shrub | Well equipped | | 1 | | 1:25 | |
|  | * Crushes * Milking parlor * Barn * Crushes, Feeding facility * Cattle shed, Cattle dips * Feed storage facility * dairy farm * Farm office * Pasture forage * Hay, Silage * Straw * Grain by-products | In good condition | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| 3. | Dairy cattle feeds | * Carbohydrates * Proteins * Vitamins * Minerals * Fats/ lipids * Water | | Adequate | |  | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Wheelbarrow | Any model | | | 5 | | 1:5 |
|  | Scissors | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Hand drill | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Panga | Any five | | | 5 | | 1:5 |
|  | Measuring tape | Any five | | | 5 | | 1:5 |
|  | Spade | Any five | | | 5 | | 1:5 |
|  | String/line | Any five | | | 5 | | 1:5 |
|  | Surgical blades | In good condition | | | 5 | | 1:5 |
|  | Ear Notchers | In good condition | | | 5 | | 1:5 |
|  | Milking machine | In good condition | | | 1 | | 1:25 |
|  | * Animal Restraint * Cleaning * Cups * Herd Test Buckets * Thermometer * Separator * CMT * Strip cup * Milking machine * Ear tattooing |  | | | 5 in each category | | 1:5 |
|  | Ear tags | In good condition | | | 5 | | 1:5 |
|  | Neck chains | In good condition | | | 5 | | 1:5 |
|  | Straps with numbers | In good condition | | | 5 | | 1:5 |
|  | Branding |  | | |  | |  |
|  | Herd Test Buckets  Thermometer |  | | |  | |  |
| **F** | **Specimens** |  | | |  | |  |
| 1. | Dairy breeds | * Dairy Cattle * Friesian * Ayrshire * Sahiwal * Jersey * Brown Swiss | | | 1each type | | 1:5 |

# BEEF CATTLE MANAGEMENT

**UNIT CODE:** 0811 351 17A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Manage Beef Animals

**Duration of Unit: 80 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to manage beef animals. It involves constructing beef cattle structures, carrying out beef cattle feeding, carrying out beef cattle breeding, carrying out calf management, performing beef cattle routine management practices, manage fattening stock, slaughtering beef cattle and marketing beef products.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Construct beef cattle structures | 20 |
|  | Carry out beef cattle feeding | 5 |
|  | Carry out beef cattle breeding | 10 |
|  | Carry out calf management | 15 |
|  | Perform beef cattle routine management practices | 15 |
|  | Manage fattening stock | 10 |
|  | Slaughter beef cattle | 5 |
| **Total** | | **80** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Construct beef cattle structures | * 1. Tools and equipment   2. Beef structures      1. Crushes      2. Milking parlor      3. Barn      4. Feeding facility      5. Cattle shed      6. Cattle dips      7. Feed storage facility      8. Farm office   3. Designing of beef structures   4. Construction of beef structures   5. Maintenance of beef structures   6. Beef structure maintenance records   7. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out beef cattle feeding | * 1. Tools and equipment   2. Beef cattle feeds      1. Pasture forage      2. Hay      3. Silage      4. Straw      5. Grain by-products   3. Grouping of beef cattle based on nutritional requirements      1. Young stock      2. Steers      3. Fatteners      4. Finishers   4. Beef cattle feeding regime   5. Beef cattle feeding based on their nutritional requirements   6. Feed supplements      1. Minerals      2. Premixes      3. salts   7. Beef feed intake evaluation   8. Feed conversion efficiency evaluation   9. Beef cattle feeding records   10. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out beef cattle breeding | * 1. Breeding tools and equipment   2. Beef cattle breeds      1. Angus      2. Hereford      3. Charolais      4. Simmental   3. Signs of heat   4. Estrus synchronization   5. Flushing   6. Beef cattle servicing   7. Breeding methods and technologies      1. Artificial insemination      2. Natural method      3. Cross breeding      4. Pure breeding      5. Inbreeding      6. Embryo transfer   8. Surrogate   9. Care for In-calf beef   10. Steaming up   11. Parturition management   12. Breeding records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out calf management | * 1. Calf management tools, equipment and materials   2. Preparation of calf pen   3. Handling of calf at birth   4. Feeding calf on colostrum   5. Fostering of orphaned calves   6. Preparation of artificial colostrum   7. Methods of calf identification      1. Ear tagging      2. Ear notching      3. Branding      4. Neck chains      5. Straps with numbers   8. Calf housing   9. Introduction of calf to roughage feeding   10. Disbudding of calf a and removal of extra mammary teats   11. Calf weighing   12. Monitoring of calf growth rate   13. Calf weaning   14. Management and disposal of wastes | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform beef cattle routine management practices | * 1. Beef cattle identification methods      1. Ear tagging      2. Ear notching      3. Branding      4. Neck chains      5. Straps with numbers      6. Ear tattooing   2. Dehorning and disbudding of beef cattle      1. Hot iron      2. Use of chemicals      3. Use of Saws      4. Electric method      5. Disbudding rod      6. Dehorning wire   3. Castration of beef cattle   4. Hoof trimming of beef cattle   5. Culling   6. Control of internal and external parasites      1. Dipping      2. Bush clearing      3. Dusting      4. Spraying      5. Deworming      6. Drenching   7. Vaccination   8. Cattle isolation and quarantine   9. Provision of clean water ad-libitum | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage fattening stock | * 1. Tools and equipment   2. Preparation of Feedlot facilities      1. Feedlot pens      2. Feed storage      3. Feed processing mill      4. Feed mixing/batching      5. Feed bunks   3. Selection of fattening stock   4. Management practices for Fattening stock      1. Vaccination      2. Hoof care      3. Deworming      4. Disease and parasite control   5. Monitoring of fattening stock   6. Marketing of fattening stock   7. Record keeping   8. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Slaughter beef cattle | * 1. Slaughtering tools, equipment and materials      1. Knives      2. Stunners      3. Sculding tanks      4. Gabrel and hoists      5. Cutting boards and tables   2. Preparation of slaughter house slab   3. Pre-slaughter handling of beef cattle   4. Humane slaughter of beef cattle   5. Dressing of carcass   6. Cleaning of the offal   7. Preservation of dressed meat   8. Transportation of dressed meat   9. Handling of beef by-products   10. Disposal of condemned waste materials   11. Cleaning of slaughterhouse and equipment   12. Maintenance of slaughter house structures   13. Record keeping | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Market beef products | * 1. Conducting market survey   2. Transportation of cattle   3. Beef products   4. Marketing records maintenance | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources for 25 trainee**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | Breeder’s manuals by breeders like Cobb and Issa Brown | | updated | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Drinkers | 1 | | 1 | | 1:25 | |
|  | Feeding trough | 1 | | 1 | | 1:25 | |
|  | Grass | 1 | | 1 | | 1:25 | |
|  | Shrub | Well equipped | | 1 | | 1:25 | |
|  | * Crushes * Milking parlor * Barn * Crushes, Feeding facility * Cattle shed, Cattle dips * Feed storage facility * dairy farm * Farm office * Pasture forage * Hay, Silage * Straw * Grain by-products | In good condition | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
| 2 | Wheelbarrow | Any model | | | 1 | | 1:25 |
|  | Scissors | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Hand drill | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Panga | Any five | | | 5 | | 1:5 |
|  | Measuring tape | Any five | | | 5 | | 1:5 |
|  | Spade | Any five | | | 5 | | 1:5 |
|  | String/line | Any five | | | 5 | | 1:5 |
|  | Surgical blades | In good condition | | | 5 | | 1:5 |
|  | Ear Notchers | In good condition | | | 5 | | 1:5 |
|  | Ear tags | In good condition | | | 5 | | 1:5 |
|  | Neck chains | In good condition | | | 5 | | 1:5 |
|  | Straps with numbers | In good condition | | | 5 | | 1:5 |
|  | Branding iron |  | | | 5 | | 1:5 |
|  | * Herd Test Buckets * Thermometer |  | | | 5  5 | | 1:5  1:5 |
| **F** | **Specimens** |  | | |  | |  |
| 1. | beef breeds | * + Angus   + Hereford   + Charolais   + Simmental | | | 1 each type | | 1:5 |

**FARM STRUCTURES**

**UNIT CODE:** 0732 351 05 A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: establish farm structures.

**UNIT DURATION:** 100HOURS

**Unit Description**

This unit specifies competencies required to set up farm structures. It involves developing of farm plan, designing farm structures and constructing farm structures. It also involves maintenance and used farm structures.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Develop a farm plan | 15 |
|  | Design farm structures | 15 |
|  | Construct farm structures | 30 |
|  | Maintain farm structures | 20 |
|  | Use farm structures | 20 |
| **Total** | | **100** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning outcomes** | **Content** | **Suggested assessment methods** |
| 1. Develop a farm plan | * 1. Farm plan development      1. Definition of terms      2. Types of farm plans      3. Analysis of farm conditions         1. Topography         2. Wind direction         3. Soil type         4. Accessibility         5. Location of related structures         6. Security   2. Determination of space requirements of farm components   3. Farm plan layout | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Design farm structure | * 1. Farm structures design.      1. Definition of terms      2. Types of designs in farm structures      3. Factors determining farm structures design      4. Importance of designs in farm structures.      5. Determination of areas, volumes and scales in farm structures design.      6. Farm structures plans | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Construct farm structure | * 1. Farm structure construction      1. Definition of terms      2. Site selection      3. Farm structure tools and equipment   2. Uses of farm structures tools and equipment   3. Maintenance of farm structures tool and equipment   4. Design farm structures | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Maintain farm structures | * 1. Farm structure maintenance   2. Inspection of performance of constructed structures   3. Farm structure quality checked   4. Farm structure design repaired | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Role playing
* Group discussion
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio**  (Item: Trainee) |
| **A** | **Learning Materials** |  |  |  |
|  | Reference books | Farm structures | 5 pcs | 1:5 |
|  | writing materials |  | 50 | 2:1 |
|  | Charts | On farm structures | 5 | 1:5 |
|  | PowerPoint presentations | For trainer’s use | 1 | 1:25 |
|  | Whiteboard |  | 1 | 1:25 |
|  | Assorted color of whiteboard markers | For trainer’s use |  |  |
|  | Printers |  | 1 | 1:25 |
| 1. 1 | Projector |  | 1 | 1:25 |
| **B** | **Learning Facilities & infrastructure** |  |  |  |
|  | Lecture/theory room |  | 1 | 1:25 |
|  | Agriculture workshop | Well equipped | 1 | 1:25 |
| **C** | **Tools and Equipment** |  |  |  |
|  | Claw hummer |  | 5 | 1:5 |
|  | Saw |  | 5 | 1:5 |
|  | Nails | Assorted | 1 | 1:25 |
|  | Timber | Assorted | 1 | 1:25 |

# MODULE 2

# SHEEP PRODUCTION

**UNIT CODE:** 0811 351 18 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Carry Out Sheep Production

**Duration of Unit:80 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to carry out sheep production. It involves constructing sheep structures, carrying out sheep feeding, carrying out sheep breeding, carrying out lamb management, performing sheep routine management practices and marketing sheep products.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Construct sheep structures | 20 |
|  | Carry out Sheep feeding | 10 |
|  | Carry out sheep breeding | 10 |
|  | Carry out lamb management | 15 |
|  | Perform sheep routine management practices | 20 |
|  | Market sheep products | 5 |
| **Total** | | **80** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Construct sheep structures | * 1. Construction tools, equipment and materials      1. Tools * Hammer * Screw drivers * Tape measures * level * saw * drill * pliers * chisel   + 1. Equipment * Bulldozer * Cranes * Dump trucks * Mixer * Forklifts   + 1. Materials * Cement * Sand * Blocks * Quary dust   1. Selection of site of sheep structures   2. Designing sheep structures   3. Construction of sheep structures   4. Maintenance of sheep structures   5. Sheep structures construction and record maintenance   6. Wate management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out Sheep feeding | * 1. Feeding tools, equipment and materials   2. Types of sheep feeds      1. Proteins      2. Carbohydrate      3. Additives      4. Minerals   3. Provision of basal rations at various physiological stages   4. Feed supplements offered according to dietary requirement   5. Identification of grazing management   6. Determination of grazing capacity of the pasture   7. Feed intake evaluation   8. Evaluation of feed conversion efficiency   9. Sheep feeding record   10. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out sheep breeding | * 1. Breeding management tools, equipment and materials   2. Sheep breeds      1. Hampshire Sheep      2. Dorset Sheep      3. Merino Sheep      4. Corriedale Sheep      5. Maasai sheep      6. Doper      7. Black head Persian   3. Selection of sheep breeds   4. Heat signs in ewes   5. Flushing   6. Raddling   7. Crutching and ringing   8. Servicing   9. Breeding methods and technologies      1. Artificial insemination      2. Natural method      3. Embryo transfer      4. Surrogate   10. Provision of care for pregnant ewes       1. Steaming up   11. Lambing management   12. Breeding records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out lamb management | * 1. Handling of lamb at birth   2. Feeding lamb on colostrum   3. Fostering of orphaned lambs   4. Lamb identification methods   5. Docking   6. Lamb weighing   7. Monitoring of lamb growth rate   8. Waste management | * Practical * Projects * Demonstrations * Direct instructions * Written assessment * Oral questioning |
| 1. Perform sheep routine management practices | * 1. Sheep identification method      1. Ear Tagging      2. Ear Notching      3. Neck Chains or Straps   2. Sheep castration      1. **Closed castration**      2. **Surgical Castration**   3. Trimming of overgrown hooves   4. Wigging   5. Shearing   6. Culling   7. Control of internal and external parasites   8. Isolation and quarantine   9. Control of notifiable diseases      1. Vaccination      2. Quarantine      3. Burning of carcass      4. Burring of carcass      5. Disinfection   10. Provision of clean water ad-libitum   11. Record keeping | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Market sheep products | * 1. Conducting market survey   2. Sheep products      1. Mutton      2. Wool      3. Hooves   3. Sheep transportation   4. Marketing records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources for 25 trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | Breeder’s manuals | | updated | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Drinkers | 1 | | 1 | | 1:25 | |
|  | Feeding trough | 1 | | 1 | | 1:25 | |
|  | Grass | 1 | | 1 | | 1:25 | |
|  | Shrub | Well equipped | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Wheelbarrow | Any model | | | 1 | | 1:25 |
|  | Scissors | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Hand drill | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Panga | Any five | | | 5 | | 1:5 |
|  | Measuring tape | Any five | | | 5 | | 1:5 |
|  | Spade | Any five | | | 5 | | 1:5 |
|  | String/line | Any five | | | 5 | | 1:5 |
|  | Surgical blades | In good condition | | | 5 | | 1:5 |
|  | Ear Notchers | In good condition | | | 5 | | 1:5 |
|  | Ear tags | In good condition | | | 5 | | 1:5 |
|  | Neck chains | In good condition | | | 5 | | 1:5 |
|  | Straps with numbers | In good condition | | | 5 | | 1:5 |
| **F** | **Specimens** |  | | |  | |  |
| 1. | sheep breeds | * Hampshire Sheep * Dorset Sheep * Merino Sheep * Corriedale Sheep * Maasai sheep * Doper * Black head Persian | | | 1 each type | | 1:25 |

# 

# GOAT PRODUCTION

**UNIT CODE:** 0811 351 19 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Carry Out Goat Production

**Duration of Unit: 80 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to carry out goat production. It involves constructing goat structures, carrying out goat breeding, carrying out goat feeding, performing goat routine management practices, carrying out kid management and marketing goat products.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Construct goat structures | 20 |
|  | Carry out goat feeding | 10 |
|  | Carry out goat breeding | 10 |
|  | Perform goat routine management practices | 20 |
|  | Carry our kid management | 10 |
|  | Market goat products | 10 |
| **Total** | | **80** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Construct goat structures | * 1. Tools, equipment and materials   1.1.1 tools   * Hammer * Screw drivers * Tape measures * Level * Saw * Drill * Pliers * Chisel   1.1.2 Equipment   * Bulldozer * Cranes * Dump trucks * Mixer * Forklifts   1.1.3 materials   * Cement * Sand * Blocks * Quary dust   1. Selection of site for goat structure   2. Construction of goat structures   3. Maintenance of goat structures   4. Construction and maintenance of goat structure records   5. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out goat feeding | * 1. Feeding tools, equipment and materials   2. Goat feeds   + Grass   + Shrubs   + Commercially formulated feeds   1. Provision of basal rations   2. Feed supplements   + Vitamins   + Minerals   + Hormones   + Medicants   1. Grazing management   2. Pasture grazing capacity   3. Evaluation of feed intake   4. Evaluation of feed conversion efficiency   5. Goat feeding records   6. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out goat breeding | * 1. Breeding management tools, equipment and materials   2. Goat breeds   + Angora, Alpine   + Toggenburg   + Saanen, Jamnapuri   + Boar, Anglo-Nubian   + Somali/ Galla   1. Selection of goat breeds   2. Heat signs in does   3. Flushing   4. Servicing   5. Natural mating   6. Artificial insemination   7. Provision of care to pregnant does   8. Steaming up   9. Management of kid   10. Breeding records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform goat routine management practices | * 1. Goat identification methods   + Tattooing   + Ear-tagging   + Ear notching   + Microchips   4.2 Goat castration methods   * + Rubber ringing   + Open castration   + Closed castration   4.3 Hoof trimming   * 1. Shearing   2. Culling   3. Control of internal and external parasites   4. Vaccination   5. Isolation and quarantine   6. Provision of clean water ad-libitum   7. Records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry our kid management | * 1. Handling of kids at birth   2. Feeding kids on colostrum   3. Fostering of orphaned kids   4. Kid identification methods   + Ear Tagging   + Ear Notching   + Neck Chains or Straps   1. Weighing of kids   2. Monitoring of kid growth rate   3. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Market goat products | * 1. Conducting Market survey   2. Goat products * Milk * Wool * Shoven * Skin * Hooves   1. Goat transportation   2. Goat products marketing   3. Marketing records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources for 25 trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | Breeder’s manuals | | updated | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Drinkers | 1 | | 1 | | 1:25 | |
|  | Feeding trough | 1 | | 1 | | 1:25 | |
|  | Grass | 1 | | 1 | | 1:25 | |
|  | Shrub | Well equipped | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Wheelbarrow | Any model | | | 1 | | 1:25 |
|  | Scissors | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Hand drill | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Panga | Any five | | | 5 | | 1:5 |
|  | Measuring tape | Any five | | | 5 | | 1:5 |
|  | Spade | Any five | | | 5 | | 1:5 |
|  | String/line | Any five | | | 5 | | 1:5 |
|  | Surgical blades | In good condition | | | 5 | | 1:5 |
|  | Ear Notchers | In good condition | | | 5 | | 1:5 |
|  | Ear tags | In good condition | | | 5 | | 1:5 |
|  | Neck chains | In good condition | | | 5 | | 1:5 |
|  | Straps with numbers | In good condition | | | 5 | | 1:5 |
| **F** | **Specimens** |  | | |  | |  |
| 1. | Goat breeds | Angora,  Alpine  Toggenburg  Saanen  Jamnapuri  Boar  Anglo-Nubian  Somali/ Galla | | | 5each type | | 1:5 |

# PIG PRODUCTION

**UNIT CODE:** 0811 351 20A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Carry Out Pig Production

**Duration of Unit: 100 Hours**

**UNIT DESCRIPTION**

This unit describes competencies required to carry out pig production. It involves constructing pig structures, feeding pigs, carrying out breeding, carrying out piglet rearing, performing routine management practices, performing pig slaughter, process pig products and by-products and market pig products.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Construct pig structures | 20 |
|  | Carry out pig feeding | 10 |
|  | Carry out pig breeding | 10 |
|  | Carry our piglet rearing | 10 |
|  | Perform pig routine management practices | 20 |
|  | Perform pig slaughter | 10 |
|  | Process pig products and by- products | 10 |
|  | Market pig products | 10 |
| **Total** | | **100** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Construct pig structures | * 1. Construction tools, equipment and materials   1.1.1 Tools   * hammer * Screw drivers * tape measures * level * saw * drill * pliers * chisel   1.1.2 Equipment   * Bulldozer * Cranes * Dump trucks * Mixer * Forklifts   1.1.3 Materials   * Cement * Sand * Blocks * Quary dust   1. Site selection for pig structure   2. Construction of pig structure   3. Maintenance of pig structures   4. Construction and maintenance of pig structure records   5. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out pig feeding | * 1. Feeding tools, equipment and materials * Feed basins * Feed mixer * Hay feeders * Mineral feeders   1. Pig feeds * Sow and weaner * Pig finisher * Pig starter * Creep feeds   1. Provision of basal rations   2. Feed supplements * Wheat bran * Creep feed * Mineral licks * Feed additives   1. Evaluation of feed intake   2. Evaluation of feed conversion efficiency   3. Pig feeding records   4. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out pig breeding | * 1. Pig breeding management tools, equipment and materials * Heat detection devices * Insemination guns   3.2 Pig breeds   * Large white * Landrace * Duroc jersey * Berkshire   1. Selection of pig breeds   2. Heat signs in Does   3. Flushing   4. Breeding methods and technologies * A.1 * Synchronization * Cross breeding * Pure breeding * Inbreeding   1. Provision of care to pregnant does   2. Steaming up   3. Farrowing management   4. Breeding records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry our piglet rearing | * 1. Assembling of tools, equipment and materials   2. Nutritional management applied on suckling sow and piglets * Flushing * Steaming up * Fattening * Creep feeding   1. Environmental conditions maintained in piglet pens * Temperature * Cleanliness * Humidity * Light   1. Health monitoring and management   2. Piglets handling   3. Preparation of Artificial colostrum   4. Weighing of piglets   5. Vaccination   6. Iron supplementation   7. Teeth clipping   8. Docking   9. Weaning management conduction   10. Record maintenance   11. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform pig routine management practices | * 1. Pig identification methods   + Ear tags   + Ear notching   + Neck chains   + Straps with numbers   1. Grooming performance   2. Hygiene and sanitation   3. Culling   4. Control of internal and external parasites   5. Isolation and quarantine   6. Provision of clean water ad-libitum   7. Records preparation   8. Pig farm bio-security practices * Foot bath * Quarantine * Pen disinfection * Equipment sterilization * Fencing | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform pig slaughter | * 1. Slaughter tools, equipment and materials * Knives * Stunners * Sculding tanks * Gabrel and hoists * Cutting boards and tables   1. Preparation of slaughter house/slab   2. Pre-slaughter handling of pigs   3. Perform humane slaughter of pigs   4. Carcass dressing   5. Offal cleaning   6. Preservation of dressed meat   7. Transportation of dressed meat   8. Food safety and hygiene measures   9. Handling of by-products   10. Disposal of condemned materials and wastes * Parasite infested organs * Dead foetus * Hydrated infested liver * Whole carcass   1. Cleaning of slaughter house and equipment   2. Maintaining slaughter structures   3. Record keeping | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Process pig products and by-products | * 1. Data collection tools   2. Conducting market survey   3. Preparation of market survey report   4. Pig products * Sausages * Bacon * Lard * Cuts * Brawn * Smokies * Burger   1. Permits and certificates * Movement permits * No objection permits * Meat inspection permits * Food and hygiene certificate * Meat transportation permit   1. Tools, equipment and materials for slaughter * Knives * Stunners * Sculding tanks * Gabrel and hoists * Cutting boards and tables   1. Production schedules development   2. PPEs identification   3. Identification of carcass for processing   4. Processing of pig products   5. Food safety and hygiene   6. Packaging and storage of pig products   7. Report on pig product and by-products marketing   8. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Market pig products | * 1. Market survey   2. Identification of marketing channels   3. Development and implementation of marketing strategy   4. Identification of products competitive advantage   5. Product price   6. Product outlets   7. Contractual agreements undertaking * Verbal * Written   1. Marketing strategy   2. Report on pig products | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources for 25 trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 50 | | 1:1 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | National Pig Development Programme Manual | | updated | 5 | | 1:5 | |
|  | Breeder’s manuals | | updated | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Drinkers | 1 | | 1 | | 1:25 | |
|  | Feeding trough | 1 | | 1 | | 1:25 | |
|  | Grass | 1 | | 1 | | 1:25 | |
|  | Shrub | Well equipped | | 1 | | 1:25 | |
|  |  | sufficient | |  | |  | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Wheelbarrow | Any model | | | 1 | | 1:25 |
|  | Scissors | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Hand drill | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Panga | Any five | | | 5 | | 1:5 |
|  | Measuring tape | Any five | | | 5 | | 1:5 |
|  | Spade | Any five | | | 5 | | 1:5 |
|  | String/line | Any five | | | 5 | | 1:5 |
|  | Surgical blades |  | | |  | |  |
|  | Ear Notchers |  | | |  | |  |
|  | Ear tags |  | | |  | |  |
|  | Neck chains |  | | |  | |  |
|  | Straps with numbers |  | | |  | |  |
| **F** | **Specimens** |  | | |  | |  |
| 1. | Pig breeds | large white, landrace, duroc,new humpshire | | | 5each type | | 1:5 |

# POULTRY PRODUCTION

**UNIT CODE:** 0811 351 21A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Carry Out Poultry Production

**Duration of Unit: 120 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to carry out poultry production. It involves constructing poultry structures, carrying out chick brooding, managing layer poultry, managing meat poultry, managing poultry slaughter, managing poultry breeding and marketing poultry products.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Construct poultry structures | 30 |
|  | Carry out chick brooding | 20 |
|  | Manage Layer Poultry | 20 |
|  | Manage meat poultry | 10 |
|  | Manage poultry slaughter | 20 |
|  | Manage breeding poultry | 10 |
|  | Market poultry products | 10 |
| **Total** | | **120** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Construct poultry structures | * 1. Construction tools, equipment and materials   1.1.1 tools   * hammer * Screw drivers * tape measures * level * saw * drill * pliers * chisel   1.1.2 equipment   * Bulldozer * Cranes * Dump trucks * Mixer * Forklifts   1.1.3 materials   * Cement * Sand * Blocks * Quary dust   1. Selection of site for poultry structure   2. Designing of poultry structure   3. Construction of poultry structures   4. Construction and maintenance of poultry structure records   5. Waste management   6. Poultry house equipment and material * Waterers * Feeders * Thermometer * Heat sources * Litter material * Curtains * False ceilings * Hygrometer   1. Installation of poultry house equipment and materials   2. Poultry production manuals   + National Poultry Development Programme Manual   + Breeder’s manuals by breeders like Cobb and Issa Brown | * + Written assessment   + Practical   + Projects   + Third party report   + Portfolio of evidence   + Oral questions |
| 1. Carry out poultry brooding | * 1. Chick brooder tools, equipment and materials * Brooder thermometer * Charcoal jiko * Infra-red bulb * Gas burner * Kerosene lamp * Chick feeder * Chick drinker * Hygrometer   1. Brooder construction   2. Brooder and brooder Equipment disinfection   3. Setting of chick brooder equipment   4. Monitoring of microclimate   5. Feeding of brooding chicks   6. Bio-safety structures/facilities. * Foot bath * Sanitizer * Fence   1. Vaccination of brooding chicks   2. Execution of predator control   3. Chick brooding records   4. Waste management | * + Written assessment   + Practical   + Projects   + Third party report   + Portfolio of evidence   + Oral questions |
| 1. Manage Layer Poultry | * 1. Poultry layer tools, equipment and materials * Waterers * Feeders * Thermometer * Litter material * Curtains * False ceilings * Hygrometer   1. Layers house sanitization procedures   2. Micro climate monitoring   3. Feeding of Layer poultry   4. Layer poultry vaccination   5. Monitoring of post-vaccination behaviour   6. Collection of Table poultry eggs   7. Sorting and grading of Table poultry eggs.   8. Cleaning of table poultry eggs   9. Packaging of table poultry eggs   10. Branding of table poultry eggs   11. Recording of poultry layers   12. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage meat poultry | * 1. Assembling of tools, equipment and materials   2. Sanitization of meat poultry house   3. Monitoring of microclimate   4. Feeding of meat poultry   5. Vaccination   6. Post-vaccination behaviour monitoring   7. Catching of meat poultry   8. Weighing meat poultry   9. Packaging and loading of meat poultry   10. Recording of meat poultry   11. Dispatching meat poultry   12. Recording of meat poultry   13. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage poultry slaughter | * 1. Poultry slaughter tools, equipment and materials * Knives * Stunners * Sculding tanks * Gabrel and hoists * Cutting boards and tables   1. Selection of poultry for slaughter   2. Ante-Morten inspection   3. Slaughtering of poultry   4. Cleaning eviscerated poultry carcass   5. Chilling and grading of poultry carcass   6. Packaging of portioned poultry meat   7. Poultry slaughter records   8. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage breeding poultry | * 1. Poultry breeding tools,   equipment and materials   * Housing * Feeders * Heaters * Incubators * Brooders * Health monitoring tools   1. Designing mating and breeding system   2. Selection of breeding poultry   3. Mating of selected breeding poultry   4. Feeding of breeding poultry   5. Vaccination   6. Post-vaccination behaviour monitoring   7. Collection of eggs   8. Sorting and storage of eggs   9. Selection of eggs for hatching   10. Breeding poultry records   11. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Market poultry products | * 1. Market survey   2. Poultry products * Eggs * Poultry meat * Feathers * Manure * Offal   1. Transportation of poultry products   2. Record keeping | * + Written assessment   + Practical   + Projects   + Third party report   + Portfolio of evidence   + Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 50 | | 1:1 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | National Poultry Development Programme Manual | | updated | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Brooder | 1 | | 1 | | 1:25 | |
|  | Grower house | 1 | | 1 | | 1:25 | |
|  | Layer’s house | 1 | | 1 | | 1:25 | |
|  | Broiler house | Well equipped | | 1 | | 1:25 | |
|  | Feed store | Well equipped | | 1 | | 1:25 | |
|  | Slated floors | Well equipped | | 1 | | 1:25 | |
|  | Cages | Well equipped | | 1 | | 1:25 | |
|  | Pallets | sufficient | |  | |  | |
|  | Waterers | sufficient | |  | |  | |
|  | Feeders | sufficient | |  | |  | |
|  | Heat sources | sufficient | |  | |  | |
|  | Charcoal jiko | sufficient | |  | |  | |
|  | Infra-red bulb | sufficient | |  | |  | |
|  | Gas burner | Good working condition | | 5 | | 1:5 | |
|  | Kerosene lamp | Good working condition | | 5 | | 1:5 | |
|  | Chick feeder | Good working condition | | 5 | | 1:5 | |
|  | Chick drinker | Good working condition | | 5 | | 1:5 | |
|  | Foot bath | Good working condition | | 5 | | 1:5 | |
|  | Sanitizer | sufficient | | 1 | | 1:25 | |
|  | Fence | In good condition | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| * 1. 47. | Litter material | sufficient | | 5 | | 2:5 | |
| * 1. 48. | Curtains | sufficient | | sufficient | | sufficient | |
| * 1. 49. | False ceilings | sufficient | | sufficient | | sufficient | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Computers/Laptops | Any model | | | 1 | | 1:25 |
|  | Projector | LED.LCD, Laser | | | 51 | | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Thermometer (maximum – minimum) | Any five | | | 5 | | 1:5 |
|  | Hygrometer | Any five | | | 5 | | 1:5 |
|  | Brooder thermometer | Any five | | | 5 | | 1:5 |
|  | Hygrometer | Any five | | | 5 | | 1:5 |
| **F** | **Specimens** |  | | |  | |  |
| 1. | poultry | Broiler, layers,chicks,pullets | | | 5 each type | | 1:5 |

# 

# MODULE 3

# DIGITAL LITERACY

**UNIT CODE:** 0611 551 01 A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply Digital Literacy

**Duration of Unit: 4**0 Hours

**Unit Description**

This unit covers the competencies required to demonstrate digital literacy. It involves operating computer devices, solving tasks using the Office suite, managing data and information, performing online communication and collaboration, applying cybersecurity skills, and performing jobs online.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Operate Computer Devices | **6** |
|  | Solve Tasks Using Office Suite | **14** |
|  | Manage Data and Information | **6** |
|  | Perform Online Communication and Collaboration | **4** |
|  | Apply Cybersecurity Skills | **4** |
|  | Perform Online Jobs | **4** |
|  | Apply job entry techniques | **2** |
| **Total** | | **40** |

**Learning Outcomes, Content, and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested**  **Assessment Methods** |
| --- | --- | --- |
| 1. Operate computer devices | * 1. Meaning and importance of digital literacy   2. Functions and Uses of Computers   3. Classification of computers   4. Components of a computer system   5. Computer Hardware      1. The System Unit E.g. Motherboard, CPU, casing      2. Input Devices e.g. Pointing, keying, scanning, voice/speech recognition, direct data capture devices.      3. Output Devices e.g. hardcopy output and softcopy output      4. Storage Devices e.g. main memory e.g. RAM, secondary storage (Solid state devices, Hard Drives, CDs & DVDs, Memory cards, Flash drives      5. Computer Ports e.g. HDMI, DVI, VGA, USB type C etc.   6. Classification of computer software   7. Operating system functions   8. Procedure for turning/off a computer   9. Mouse use techniques   10. Keyboard Parts and Use Techniques   11. Desktop Customization   12. File and Files Management using an operating system   13. Computer Internet Connection Options       1. Mobile Networks/Data Plans       2. Wireless Hotspots       3. Cabled (Ethernet/Fiber)       4. Dial-Up       5. Satellite   14. Computer external devices management       1. Device connections       2. Device controls (volume controls and display properties) | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Solve tasks using Office suite | * 1. Meaning and Importance of Word Processing   2. Examples of Word Processors   3. Working with word documents      1. Open and close word processor      2. Create a new document      3. Save a document      4. Switch between open documents   4. Enhancing productivity      1. Set basic options/preferences      2. Help resources      3. Use magnification/zoom tools      4. Display, hide built-in tool bar      5. Using navigation tools   5. Typing Text   6. Document editing (copy, cut, paste commands, spelling and Grammar check)   7. Document formatting      1. Formatting text      2. Formatting paragraph      3. Formatting styles      4. Alignment      5. Creating tables      6. Formatting tables   8. Graphical objects      1. Insert object (picture, drawn object)      2. Select an object      3. Edit an object      4. Format an object   9. Document Print setup      1. Page layout,      2. Margins set up      3. Orientation.   10. Word Document Printing   11. Meaning & Importance of electronic spreadsheets   12. Components of Spreadsheets   13. Application areas of spreadsheets   14. Using spreadsheet application       1. Parts of Excel screen: ribbon, formula bar, active cell, name box, column letter,row number, Quick Access Toolbar.       2. Cell Data Types       3. Block operations       4. Arithmetic operators (formula bar (-, +, \*, /).       5. Cell Referencing   15. Data Manipulation       1. Using Functions (Sum, Average, SumIF, Count, Max, Max, IF, Rank, Product, mode etc)       2. Using Formulae       3. Sorting data       4. Filtering data       5. Visual representation using charts   16. Worksheet printing   17. Electronic Presentations   18. Meaning and Importance of electronic presentations   19. Examples of Presentation Software   20. Using the electronic presentation application       1. Parts of the PowerPoint screen (slide navigation pane, slide pane, notes, the ribbon, quick access toolbar, and scroll bars).       2. Open and close presentations       3. Creating Slides (Insert new slides, duplicate, or reuse slides.)       4. Text Management (insert, delete, copy, cut and paste, drag and drop, format, and use spell check).       5. Use magnification/zoom tools       6. Apply or change a theme.       7. Save a presentations       8. Switch between open presentations   21. Developing a presentation       1. Presentation views       2. Slides       3. Master slide   22. Text       1. Editing text       2. Formatting       3. Tables   23. Charts       1. Using charts       2. Organization charts   24. Graphical objects       1. Insert, manipulate       2. Drawings   25. Prepare outputs       1. Applying slide effects and transitions       2. Check and deliver       + Spell check a presentation       + Slide orientation       + Slide shows, navigation   26. Print presentations (slides and handouts) | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage Data and Information | * 1. Meaning of Data and information   2. Importance and Uses of data and information   3. Types of internet services      1. Communication Services      2. Information Retrieval Services      3. File Transfer      4. World Wide Web Services      5. Web Services      6. Automatic Network Address Configuration      7. NewsGroup      8. Ecommerce   4. Types of Internet Access Applications   5. Web browsing concepts      1. Key concepts      2. Security and safety   6. Web browsing      1. Using the web browser      2. Tools and settings      3. Clearing Cache and cookies      4. URIs      5. Bookmarks      6. Web outputs   7. Web based information      1. Search      2. Critical evaluation of information      3. Copyright, data protection   8. Downloads Management   9. Performing Digital Data Backup (Online and Offline)   10. Emerging issues in internet | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform online communication and collaboration | * 1. Netiquette principles   2. Communication concepts      1. Online communities      2. Communication tools      3. Email concepts   3. Using email      1. Sending email      2. Receiving email      3. Tools and settings      4. Organizing email   4. Digital content copyright and licenses   5. Online collaboration tools      1. Online Storage (Google Drive)      2. Online productivity applications (Google Docs & Forms)      3. Online meetings (Google Meet/Zoom)      4. Online learning environments      5. Online calendars (Google Calendars)      6. Social networks (Facebook/Twitter - Settings & Privacy)   6. Preparation for online collaboration      1. Common setup features      2. Setup   7. Mobile collaboration      1. Key concepts      2. Using mobile devices      3. Applications      4. Synchronization | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply cybersecurity skills | * 1. Data protection and privacy      1. Confidentiality of data/information      2. Integrity of data/information      3. Availability of data/information   2. Internet security threats      1. Malware attacks      2. Social engineering attacks      3. Distributed denial of service (DDoS)      4. Man-in-the-middle attack (MitM)      5. Password attacks      6. IoT Attacks      7. [Phishing Attacks](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#phishing-attacks)      8. [Ransomware](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#ransomware)   3. Computer threats and crimes   4. Cybersecurity control measures      1. Physical Controls      2. Technical/Logical Controls (Passwords,PINs, Biometrics)      3. Operational Controls   5. Laws governing protection of ICT in Kenya      1. The Computer Misuse and Cybercrimes Act No. 5 of 2018      2. The Data Protection Act No. 24 Of 2019 | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform Online Jobs | * 1. Introduction to online working   2. Types of online Jobs   3. Online job platforms      1. Remotask      2. Data annotation tech      3. Cloud worker      4. Upwork      5. Oneforma      6. Appen   4. Online account and profile management   5. Identifying online jobs/job bidding   6. Online digital identity   7. Executing online tasks   8. Management of online payment accounts | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply job entry techniques | * 1. Types of job opportunities      1. Self employment      2. Service provision      3. product development      4. salaried employment   2. Sources of job opportunities   3. Resume/ curriculum vitae      1. What is a CV      2. How long should a CV be      3. What to include in a AC      4. Format of CV      5. How to write a good CV      6. Don’ts of writing a CV   4. Job application letter      1. What to include      2. Addressing a cover letter      3. Signing off a cover letter   5. Portfolio of Evidence      1. Academic credentials      2. Letters of commendations      3. Certification of participations      4. Awards and decorations   6. Interview skills      1. Listening skills      2. Grooming      3. Language command      4. Articulation of issues      5. Body language      6. Time management      7. Honesty      8. Generally knowledgeable in current affairs and technical area | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods Instruction**

* + Demonstration
  + Practical
  + Viewing of related videos
  + Group discussions
  + Project
  + Role play
  + Case study

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No.** | **Category** | **Resource Description/Specifications** | **Quantity** | **Recommended Ratio (Item:Trainee)** |
| 1 | Computers | Computers with OS (Windows/Linux/Mac), MS Office, Google Workspace, Antivirus | 25 | 1:1 |
| 2 | External Storage | External storage media (e.g., flash drives, external HDDs) | 25 | 1:1 |
| 3 | Printers | High-speed, multifunction printers (print, scan, copy) | 2 | 1:12.5 |
| 4 | Printing Papers | Standard A4 printing paper | As required | - |
| 5 | Projectors | HD projectors for presentations | 1 | 1:25 |
| 6 | Whiteboards | Standard-sized whiteboards | 1 | 1:25 |
| 7 | Smartboards/Smart TV | Interactive smartboards or Smart TVs | 1 | 1:25 |
| 8 | Whiteboard Markers | Assorted colors for visual presentations | Assorted | - |
| 9 | Internet Connection | High-speed internet for online resources and software | 1 network | 1:25 |
| 10 | Sample CVs | Professional CV samples | 3 | 1:1 |
| 11 | Sample Job Applications | Templates or examples of job application letters | 3 | 1:1 |

# COMMUNICATION SKILLS

**UNIT CODE:** 0031 551 02A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply Communication Skills

**Duration of Unit:** 40 hours

**Unit Description**

This unit covers the competencies required to apply communication skills. It involves applying communication channels, written, non-verbal, oral, and group communication skills.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Apply communication channels | **10** |
|  | Apply written communication skills | **12** |
|  | Apply non-verbal skills | **4** |
|  | Apply oral communication skills | **4** |
|  | Apply group communication skills | **10** |
| **Total** | | **40** |

**Learning Outcomes, Content, and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Apply communication channels | * 1. Communication process   2. Principles of effective communication   3. Channels/medium/modes of communication   4. Factors to consider when selecting a channel of communication   5. Barriers to effective communication   6. Flow/patterns of communication   7. Sources of information   8. Organizational policies | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply written communication skills | * 1. Types of written communication   2. Elements of communication   3. Organization requirements for written communication | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply non-verbal communication skills | * 1. Utilize body language and   2. gestures   3. Apply body posture   4. Apply workplace dressing code | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply oral communication skills | * 1. Types of oral communication pathways   2. Effective questioning techniques   3. Workplace etiquette   4. Active listening | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply group discussion skills | * 1. Establishing rapport   2. Facilitating resolution of issues   3. Developing action plans   4. Group organization techniques   5. Turn-taking techniques   6. Conflict resolution techniques   7. Team-work | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Discussion
* Roleplaying
* Simulation
* Direct instruction
* Demonstration
* Field trips

**Recommended Resources for 25 trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio**  (Item: Trainee) |
| **A** | **Learning Materials** | | | |
|  | Charts | * Flip Charts * Rules and Regulations | 5 | 1:5 |
|  | Report Writing Templates | Printed copies and softcopies | 25 | 1:1 |
|  | Assorted Markers | whiteboard markers and permanent | 5 | 1:5 |
|  | Samples Of CVS | Printed copies and softcopies | 5 | 1:5 |
|  | External Storage Media | Flash disks, Compass Disks; Re-Writable | 1 | 1:25 |
|  | Smartboard/Smart TV (Where Applicable) | LCD or projector | 20 | 1:25 |
| **B** | **Learning Facilities & Infrastructure** | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | 1 | 1:25 |
|  | Workshop | (10\* 15 sq. metres) | 1 | 1:25 |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | 1 | 1:25 |
| **C** | **Consumable Materials** | | | |
|  | Flashcards | Alphabet, Numbers, Math | 25 | 1:1 |
|  | Printing Papers | Sizes A4, A3, A2 etc | 5 reams | 1:5 |
| **D** | **Tools And Equipment** | | | |
|  | Computers/Laptops | Any model | 1 | 1:25 |
|  | Projector | LED.LCD, Laser | 1 | 1:25 |
|  | Printer | Inkjet, LaserJet | 1 | :25 |
|  | Computers Software: | •Windows/Linux/Macintosh Operating System  •Microsoft Office Software  •Google Workspace Account  Antivirus Software | 1 | 1:1 |
|  | Whiteboard | Glass, melamine, porcelain | 1 | 1:25 |
|  | Mobile Phones | Smartphones | 5 | 1:5 |

# RABBIT PRODUCTION

**UNIT CODE:** 0811 451 22A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Rabbit Production.

**UNIT DURATION: 50** Hours

**Unit Description**

This unit specifies competencies required to carry-out rabbit production. It involves construction of rabbit structures, feeding of rabbits, breeding of rabbits, rearing of rabbit litter, performing of routine management practices and marketing of rabbit products.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Construct rabbit structures | **10** |
|  | Carry out rabbit feeding | **5** |
|  | Carry out rabbit breeding | **5** |
|  | Rear rabbit litter | **5** |
|  | Perform rabbit routine management practices | **10** |
|  | Market rabbit products | **5** |
| **Total** | | **50** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 1. Construct rabbit structures | * 1. Personal Protective Equipment (PPEs) * Gloves * Overall * Gumboots * Nose mask   1. Rabbit structures      1. Hutches      2. Cages      3. Feed storage facility   2. Construction tools * Hammer * Panga * Auger * Tape measure   1. Construction of rabbit structures   2. Construct Rabbit structures | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out rabbit feeding | * 1. Rabbit feeds      1. Roughages      2. Concentrates      3. Rabbit pellets   2. Rabbits Classification      1. Kindle      2. Winners      3. Bucks      4. Does   3. Rabbit feeding   4. Rabbit nutritional requirements      1. Carbohydrates      2. Proteins      3. Vitamins      4. Minerals   5. Feed intake evaluation   6. Feed conversion efficiency evaluation   7. Feeding records   8. Waste management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out rabbit breeding | * 1. Rabbit breeds      1. New Zealand white rabbit      2. Flemish Giant rabbit      3. French Lop   2. Rabbit breeding schedule   3. Rabbit breeding programme | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Rear rabbit litter | * 1. Kindles rearing   2. Routine feeding of kindles   3. Kindle identification   4. Identification of small and less vigorous kindle for specialized feeding   5. Regular monitoring of kindle progress   6. Feeding of kindles   7. Monitoring of kindle progress through weighing | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform rabbit routine management practices | * 1. Methods of controlling external parasites      1. Dusting      2. Hand dressing      3. Sanitation   2. Control of internal parasites      1. Drenching      2. Injection      3. Sanitation   3. Bio-security measures in disease prevention      1. Fencing      2. Hygiene   4. Preparation of Rabbit management records      1. Feeding records      2. Health records      3. Breeding records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Market rabbit products | * 1. Preparation of Rabbit for slaughtering   2. Slaughtering of Rabbit      1. Dislocation      2. Dressing   3. Rabbit carcass packaging   4. Rabbit slaughtering   5. Rabbit carcass packaging | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Hatch | spacious | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| * 1. 28. | drugs | Dewormer, Vaccines | | 5 | | 2:5 | |
| * 1. 29 | Construction materials | As necessary | | 1 | | 1:25 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Computers/Laptops | Any model | | | 1 | | 1:25 |
|  | Projector | LED.LCD, Laser | | | 1 | | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Breeding tool | Any five | | | 5 | | 1:5 |
| **F** | **Specimens** |  | | |  | |  |
| 1. | Rabbits | Any breed | | | 5 | | 1:5 |

# BEE PRODUCTION

**UNIT CODE:** 0811 451 23A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Bee production

**Duration of the unit: 100 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to carry-out bee production. It involves establishing an apiary, managing bee facilities, tools and equipment; managing bee colony, managing bee pests and diseases, harvesting bee products and marketing of bee products.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Establish an apiary | **20** |
|  | Manage bee facilities, tools and equipment | **10** |
|  | Manage bee colony | **20** |
|  | Manage bee pest and diseases | **20** |
|  | Harvest bee products | **20** |
|  | Market bee products | **10** |
| **Total** | | **100** |

**Learning Outcomes, Content and Methods of assessment**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Methods of assessment** |
| 1. Establish an apiary | * 1. Materials, tools and equipment for preparing the apiary * Panga * Slasher * Jembe * Auger * Tape measure   1. Apiary site selection   2. Apiary site preparation | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage bee facilities, tools and equipment | * 1. Personal protective equipment (PPEs) * Bee suit * Gloves * Gumboots   1. Apiary management tools and equipment      1. Smokers      2. Hive tools      3. Conical honey strainer      4. Wax press      5. Solar wax melter   2. Repairable Bee facilities, equipment and tools      1. Bee hives      2. Smokers      3. Queen cages      4. Feeders      5. Queen cell protector      6. Drone trap      7. Queen excluder      8. Pollen trap   3. Bee facilities, tools and equipment storage | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage bee colony | * 1. Personal protective equipment * Bee suit * Gloves * Gumboots   1. Opening of Bee hives   2. Tools and equipment for colony division      1. Smokers      2. Hive tools      3. Bee brush   3. Division of honey bee colony      1. Strong colony identification      2. New queen selection      3. Resource division      4. Queen cell introduction      5. Location of new colonies   4. Colony divisions | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage bee pests and diseases | * 1. Personal Protective gears      1. Bee suit      2. Gloves      3. Gumboots   2. Hive smoking and opening   3. Colony inspection   4. Signs and symptoms of pest and diseases      1. Diseases         1. Foul brood         2. Fungal brood         3. Bee diarrhoea         4. Chalkbrood         5. Stonebrood      2. Parasites         1. Small Hive Beetle (SHB)         2. Carpenter bee         3. Honey bee         4. Bumblebee         5. Ants         6. Mite         7. Lesser wax moth         8. Bee louse         9. Greater wax moth   5. Control measures      1. Hygienes      2. Regular inspection      3. Destruction of infected combs | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Harvest bee products | * 1. Personal protective gears      1. Bee suits      2. Veil      3. Gloves      4. Boots      5. Smoker      6. First aid kit   2. Identification ocolonies to be harvested   3. Hive opening   4. Hive products harvesting      1. Ripe honey      2. Bee propolis harvesting      3. Bee pollen trapping and harvesting      4. Bee broods harvesting | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Market bee products | * 1. Hive products packaging      1. Honey      2. Propolis      3. Bee venom      4. Creamed honey      5. Comb honey      6. Honeycomb      7. Beeswax      8. Bee pollen      9. Royal jelly   2. Hive products labelling and branding   3. Marketing of Hive products | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of delivery**

* Practical
* Projects
* Demonstrations
* Group discussion
* Direct instructions
* Site visit

**Recommended Resources for 25 trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
| 1 | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
| 2. | Markers | | whiteboard markers and permanent markers | 5 | | 1:25 | |
| 3. | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
| 4. | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
| 5. | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
| 1. | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
| 2. | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
| 3. | Flowering plants | sufficient | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
| 1. | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
| 2. | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| * 1. .3. | water | sufficient | | 5 | | 2:5 | |
| **D** | **Tools And Equipment** | | | | | | |
| 1. | Computers/Laptops | Any model | | | 1 | | 1:25 |
| 2. | Projector | LED.LCD, Laser | | | 5 | | 1:5 |
| 3. | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
| 4. | Solar wax maker | Any five | | | 2 | | 2:25 |
| * 1. 5. | Conical honey strainer |  | | | 5 | | 1:5 |
| * 1. 6 | Bee hive | Any five; langstroth,top bar, log, box | | | 5 | | 1:5 |
| 7. | Smoker |  | | | 5 | | 1:5 |
| * 1. 8. | Hive tool |  | | | 5 | | 1:5 |
| * 1. 9. | Centrifugal machine | any | | | 1 | | 1;25 |

# FARM MACHINERY OPERATION

**UNIT CODE:** 0716 451 07A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Operate Farm Machinery

**DURATION OF UNIT: 100 Hours**

**UNIT DESCRIPTION**

This unit equips trainees with knowledge and skills to operate farm power and machinery. It involves operating hand tools and equipment, operating tillage machinery, operating planting machinery, operating crop protection machinery, operating harvesting machinery and operating agro-processing machinery.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Operate hand tools and equipment | **10** |
|  | Operate tillage machinery | **20** |
|  | Operate planting machinery | **20** |
|  | Operate crop protection machinery | **10** |
|  | Operate harvesting machinery | **20** |
|  | Operate Agro-processing machinery | **20** |
| **Total** | | **100** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Operate hand tools and equipment | * 1. Hand tools and equipment classification      1. Garden tools and equipment * Panga * Slasher * Spade * Rake * Secateurs * Fork Jembe * Dibber   + 1. Workshop tools and equipment * Jack plane * Hand saw * Hammer * Hand drill * Tape measure * Files   + 1. Carpentry tools and equipment * Hand saw * Hammer * Chisel * Try square * Coping saw   + 1. Masonry tools and equipment * Plumb line * Brick hammer * Cold chisel * Masons level * Wheelbarrow * Masonry saw * Masonry tape measure   + 1. Livestock handling tools and equipment * Burdizzo * Tooth clipper * Ear notcher * Hoof trimmer * Elastrator * Shears * Halter   1. Hand tools and equipment utilization   2. Servicing of hand tools and equipment   3. Storage of hand tools and equipment | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Operate tillage machinery | * 1. Personal protective equipment * Googles * Ear muffs * Safety boots * Nose mask * Gloves * Overall * Dust coat   1. Operation of tillage machinery      1. Ploughs * Disc plough * Mouldboard plough * Ox- plough * Harrows * Disc harrow * Spring tine harrow   + 1. Tillers * Chisel plough * Subsoilers   1. Maintenance of tillage machinery   2. Storage of tillage machinery | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Operate planting machinery | * 1. Personal protective equipment   2. Calibration of planting machinery      1. Seed drills      2. Planters      3. Ridgers      4. Fertilizer distributors      5. Manure spreaders   3. Operation of planting machinery   4. Maintenance of planting machinery   5. Storage of planting machinery | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Operate crop protection machinery | * 1. Personal protective equipment   2. Calibration of crop protection machinery      1. Sprayers      2. Dusters   3. Operation of crop protection machinery   4. Maintenance of crop protection machinery   5. Storage of crop protection machinery | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Operate harvesting machinery | * 1. Personal protective equipment   2. Operation of harvesting machinery      1. Mowers      2. Combined harvesters      3. Potato harvester      4. Threshers      5. Balers   3. Maintenance of harvesting machinery   4. Storage of harvesting machinery | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Operate Agro-processing machinery | * 1. Personal protective equipment   2. Operation of Agro-processing machinery      1. Mills      2. Grinders      3. Shellers      4. Dryers      5. Elevator conveyors   3. Maintenance of Agro-processing machinery   4. Storage of Agro-processing machinery | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Demonstration
* Practical
* Discussions
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | * Flip Charts * Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Computers/Laptops | Any model | | | 1 | | 1:25 |
|  | Projector | LED.LCD, Laser | | | 1 | | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Tools | Carpentry tools, Garden, Workshop, Carpentry, Masonry and Livestock handling tools and equipment tools | | | Sufficient | |  |
|  | Machineries | Ploughs, Harrows, Tillers, Rotavators, Subsoilers, Seed drills, Planters, Ridgers, Fertilizer distributors, Manure spreaders, Sprayers etc | | | Sufficient | |  |

# MODULE 4

# WORK ETHICS AND PRACTICES

**UNIT CODE:** 0417 541 03A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply work ethics and practices.

**Duration of Unit:** 40 hours

**Unit Description**

This unit covers competencies required to demonstrate employability skills. It involves the ability to conduct self-management, promote ethical work practices and values, promote teamwork, manage workplace conflicts, maintain professional and personal development, apply problem-solving, and promote customer care.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Apply Self-Management Skills | **10** |
|  | Promote Ethical Practices and Values | **4** |
|  | Promote Teamwork | **10** |
|  | Maintain Professional and Personal Development | **10** |
|  | Apply Problem-Solving Skills | **4** |
|  | Promote Customer Care | **2** |
| **Total** | | **40** |

**Learning Outcomes, Content, and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Apply Self-Management Skills | * 1. Self-awareness   2. Formulating personal vision, mission, and goals   3. Healthy lifestyle practices   4. Strategies for overcoming work challenges   5. Emotional intelligence   6. Coping with Work Stress.   7. Assertiveness versus aggressiveness and passiveness   8. Developing and maintaining high self-esteem   9. Developing and maintaining positive self-image   10. Time management   11. Setting performance targets   12. Monitoring and evaluating performance targets | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Promote Ethical Work Practices And Values | * 1. Integrity   2. Core Values, ethics and beliefs   3. Patriotism   4. Professionalism   5. Organizational codes of conduct   6. Industry policies and procedures | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Promote Teamwork | * 1. Types of teams   2. Team building   3. Individual responsibilities in a team   4. Determination of team roles and objectives   5. Team parameters and relationships   6. Benefits of teamwork   7. Qualities of a team player   8. Leading a team   9. Team performance and evaluation   10. Conflicts and conflict resolution   11. Gender and diversity mainstreaming   12. Developing Healthy workplace relationships   13. Adaptability and flexibility   14. Coaching and mentoring skills | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Maintain Professional and Personal Development | * 1. Personal vs professional development and growth   2. Avenues for professional growth   3. Recognizing career advancement   4. Training and career opportunities   5. Assessing training needs   6. Mobilizing training resources   7. Licenses and certifications for professional growth and development   8. Pursuing personal and organizational goals   9. Managing work priorities and commitments   10. Dynamism and on-the-job learning | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply Problem-Solving Skills | * 1. Causes of problems   2. Methods of solving problems   3. Problem-solving process   4. Decision making   5. Creative thinking and critical thinking process in development of innovative and practical solutions | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Promote Customer Care | * 1. Identifying customer needs   2. Qualities of good customer service   3. Customer feedback methods   4. Resolving customer concerns   5. Customer outreach programs   6. Customer retention | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Demonstrations
* Simulation/Role play
* Group Discussion
* Presentations
* Projects
* Case studies
* Assignments

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio**  (Item: Trainee) |
| **A** | **Learning Materials** | | | |
|  | Charts | * Flip Charts * Rules and Regulations | 5 | 1:5 |
|  | Markers | whiteboard markers and permanent markers | 5 | 1:5 |
|  | Video clips  Audio tapes | MP4, MP3 | 5 | 1:5 |
| **B** | **Learning Facilities & Infrastructure** | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | 1 | 1:25 |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | 1 | 1:25 |
| **C** | **Consumable Materials** | | | |
|  | Flashcards | Alphabet, Numbers, Math | 25 | 1:1 |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | 5 reams | 1:5 |
| **D** | **Tools And Equipment** | | | |
|  | Computers/Laptops | Any model | 1 | 1:25 |
|  | Projector | LED.LCD, Laser | 1 | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | 1 | 1:25 |
|  | Mobile Phones | Smartphones | 5 | 1:5 |

# ENTREPRENEURIAL SKILLS

**UNIT CODE:** 0413 541 04A

**Relationship to occupational standards**

This unit addresses the unit of competency: Apply Entrepreneurial skills.

**Duration of unit:** 40 hours

**Unit Description:**

This unit covers the competencies required to demonstrate an understanding of entrepreneurship. It involves demonstrating an understanding of financial literacy, applying entrepreneurial concepts identifying entrepreneurship opportunities, applying business legal aspects, and developing business innovative strategies and business plans.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Apply financial literacy | **6** |
|  | Apply the entrepreneurial concept | **4** |
|  | Identify entrepreneurship opportunities | **6** |
|  | Apply business legal aspects | **6** |
|  | Innovate business strategies | **6** |
|  | Develop a business plan | **12** |
| **Total** | | **40** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Apply financial literacy | * 1. Personal finance management   2. Balancing between needs and wants   3. Budget preparation   4. Saving management   5. Factors to consider when deciding where to save   6. Debt management   7. Factors to consider before taking a loan   8. Investment decisions   9. Types of investments   10. Factors to consider when investing money   11. Insurance services   12. Insurance products available in the market   13. Insurable risks | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply entrepreneurial concept | * 1. Difference between entrepreneurs and business persons   2. Types of entrepreneurs   3. Ways of becoming an entrepreneur   4. Characteristics of entrepreneurs   5. Salaried employment and self-employment   6. Requirements for entry into self-employment   7. Roles of an entrepreneur in an enterprise   8. Contributions of entrepreneurship | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Identify entrepreneurship opportunities | * 1. Sources of business ideas   2. Factors to consider when evaluating business opportunity   3. Business life cycle | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply business legal aspects | * 1. Forms of business ownership   2. Business registration and licensing processing   3. Types of contracts and agreements   4. Employment laws   5. Taxation laws | pWritten assessment   * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Innovate business strategies | * 1. Creativity in business   2. Innovative business strategies   3. Entrepreneurial linkages   4. Ict in business growth and development | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Develop business plan | * 1. Business description   2. Marketing plan   3. Organizational/management   4. Plan   5. Production/operation plan   6. Financial plan   7. Executive summary   8. Business plan presentation   9. Business idea incubation | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Project (Business plan)
* Case studies
* Field trips
* Group Discussions
* Demonstrations

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio**  (Item: Trainee) |
| **A** | **Learning Materials** | | | |
|  | Charts | * Flip Charts * Rules and Regulations | 5 | 1:5 |
|  | Markers | whiteboard markers and permanent markers | 5 | 1:5 |
|  | Video clips  Audio tapes | MP4, MP3 | 5 | 1:5 |
|  | Newspapers and Handouts | Daily | 25 | 1:1 |
|  | Business Journals | Annual, Monthly, Daily | 25 | 1:1 |
| **B** | **Learning Facilities & Infrastructure** | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | 1 | 1:25 |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | 1 | 1:25 |
| **C** | **Consumable Materials** | | | |
|  | Flashcards | Alphabet, Numbers, Math | 25 | 1:1 |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | 5 reams | 1:5 |
| **D** | **Tools And Equipment** | | | |
|  | Computers/Laptops | Any model | 1 | 1:25 |
|  | Projector | LED.LCD, Laser | 1 | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | 1 | 1:25 |

# ANIMAL ANATOMY AND PHYSIOLOGY

**UNIT CODE:** 0511 451 06 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply Anatomy and Physiology

**DURATION OF UNIT: 100 hours**

**UNIT DESCRIPTION**

This unit describes knowledge, skills and attitudes required to apply animal anatomy and physiology. It involves carrying out animal classification, applying morphology and physiology in animal production.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Classify farm animals | **20** |
| 2. | Apply morphology in animal production | **40** |
| 3. | Apply animal physiological functions | **40** |
| **Total** | | **100** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Classify farm animals | 1.1 Classification of mammals based on taxonomic principles   * + - Cattle     - Rabbits     - Sheep     - Goats     - Donkeys     - Camel     - Horses   1. Classification of Aves based on taxonomic principles      + Chicken      + Ducks      + Guinea fowl      + Geese      + Turkey   2. Classification of Pisces based on taxonomic principles * Tilapia * Nile perch * Cat fish * Mudfish * Salmon fish   1.4 Classification of Reptiles based on taxonomic principles   * Crocodile * Turtles * Lizards * Tortoise * Snake   1. Classification of Amphibians based on taxonomic principles * Frogs * Toad * Newts * Salamander   1. Classification of Arthropods based on taxonomic principles * Tick * Spider * Obsters, * Crabs * Mites * Centipedes * Millipedes | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply morphology in animal production | * 1. Identification of external features of animals.   2. Identification and illustration of Animal anatomical structures.      1. Vertebral column      2. Skull      3. Rib      4. Forelimb      5. Hind limb      6. Pectoral girdle      7. Pelvic girdle   3. Illustration of the relationship between animal structures | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 3.Apply animal physiological functions | * 1. Identification and illustration of Animal organ systems      1. Circulatory system      2. Digestive system      3. Reproductive system      4. Respiratory system      5. Excretory system      6. Nervous system      7. Lymphatic system      8. Cardiovascular system      9. Musculoskeletal system   2. Animal physiological processes      1. Respiration      2. Thermoregulation      3. Osmoregulation   3. Adaptations Animal body organs      1. Heart      2. Lungs      3. Kidney      4. Skin      5. Liver      6. Pancreas | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Demonstration
* Practical
* Discussions
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | **Description/ Specifications** | **Quantity** | **Recommended Ratio**  (Item: Trainee) |
| **A** | **Learning Materials** | | | |
|  | Charts | * Flip Charts * Rules and Regulations | 5 | 1:5 |
|  | Markers | whiteboard markers and permanent markers | 5 | 1:5 |
|  | Video clips  Audio tapes | MP4, MP3 | 5 | 1:5 |
|  | Newspapers and Handouts | Daily | 25 | 1:1 |
|  | Business Journals | Annual, Monthly, Daily | 25 | 1:1 |
|  | Learning specimens | Animals, birds, reptiles, fishes, arthropods, skin, liver, digestive system, kidneys,pancrease etc | sufficient |  |
| **B** | **Learning Facilities & Infrastructure** | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | 1 | 1:25 |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | 1 | 1:25 |
| **C** | **Consumable Materials** | | | |
|  | Flashcards | Alphabet, Numbers, Math | 25 | 1:1 |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | 5 reams | 1:5 |
| **D** | **Tools And Equipment** | | | |
|  | Computers/Laptops | Any model | 1 | 1:25 |
|  | Projector | LED.LCD, Laser | 1 | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | 1 | 1:25 |
|  | Models | Skeletons | 1 | 1:25 |

# FISH FARM MANAGEMENT

**UNIT CODE:** 0831 451 24A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Manage fish farm

**Duration of the unit: 100 Hours**

**UNIT DESCRIPTION**

This unit describes competencies required to manage fish farm. This involves constructing fish holding units, performing fish farming management practices, process harvested fish, maintain fish hatcheries, maintain fish cages, maintain re-circulatory aquaculture and producing live fish feeds.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Construct fish holding units | **10** |
|  | Perform fish farm management practices | **20** |
|  | Process harvested fish | **10** |
|  | Maintain fish hatcheries | **20** |
|  | Maintain fish cages | **10** |
|  | Maintain re-circulatory aquaculture | **10** |
|  | Produce fish live feeds | **20** |
| **Total** | | **100** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 1. Construct fish holding units | * 1. Tools, equipment and materials for fish holding unit construction   2. Selection of fish farm   3. Designing of fish farm site   4. Preparation of fish farm site   5. Construction and installation of fish holding units   6. Installation of fish farm water filtration system   7. Auxiliary farm structures * Farm stores * Roads * Fences * Offices * Laboratories * washrooms   1. Installation of predator control devices   2. Soil erosion control   3. Conduct installation of fish farm water filtration system   4. Conduct installation of predator control devices | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform fish farm management practices | * 1. Fish farm management practices   2. Water quality parameters * Water temperature * Water PH * Dissolved oxygen * Ammonia * Nitrates * Nitrites * Salinity * Turbidity * Total suspended solids * Heavy metals * Hydrogen sulphide   1. Fertilization of the fish pond   2. Liming the fish pond   3. Fish pond weed control   4. Pond repair and maintenance      1. Sealing leakage      2. De-clogging      3. Water flow rate regulation   5. Control of fish predators   6. Signs of infection and stress in fish brood stock   7. Fish diseases and parasite      1. Bacterial diseases      2. Viral diseases      3. Fungal diseases      4. Protozoal diseases      5. Nutritional diseases      6. Worms      7. Leaches   8. Causes of fish diseases * Environmental/water quality causes * Hereditary/genetic causes * Microbial/pathogenic causes * Nutritional causes * Physical injury   1. Sanitation and hygiene practices      1. Regular hand washing      2. Sanitization      3. Disinfection      4. Use of foot bath   2. Production of fish feeds      1. Live or natural feeds      2. Concentrate feeds   3. Fish feeding   4. Evaluation of fish feeding performance   5. Bio-security measures in a fish rearing unit      1. Sanitation and hygiene practices      2. Sourcing of feeds, fingerlings, brood stock      3. Self-closing doors      4. Use of air conditioning instead of natural ventilation.      5. Use of artificial lights      6. Visitor Movement control   6. Routine fish management records   7. Waste management in a fish farm   8. Record management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Process harvested fish | * 1. Tools, equipment and materials   2. Harvesting fish   3. Sorting of harvested fish   4. Preservation methods      1. Chilling      2. Freezing      3. Salting      4. Drying      5. Salting      6. Smoking   5. Fish processing methods      1. Salting      2. Drying      3. Salting      4. Smoking      5. Filleting      6. Frying   6. Fish quality assurance   7. Marketing of fish products and by-products      1. Fish fillets      2. Bones      3. Sutures      4. Fish   8. Fish processing records   9. Carry out fish harvesting in a fish rearing unit   10. Conduct fish preservation methods   11. Conduct fish processing   12. Carry out fish quality assurance | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Maintain fish hatcheries | * 1. Personal protective gears   2. Hatchery management tools, equipment   3. Hatchery Pre-stocking activities * Cleaning * De-clogging * Removal of sludge * Fixing water leakages * Liming * Filling with water * Controlling water flow rate   1. Brood stock sourcing   2. Brood stock sorting   3. brood stock feeding   4. Water quality parameters * Water temperature * Water PH * Dissolved oxygen * Ammonia * Nitrates * nitrites * Salinity   1. Signs of infections and stress in brood stock   2. Fingerlings production   3. Fish hatchery records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage fish cages | * 1. Design, set and stock Fish cages design   2. Husbandry practices * Feeding * Aeration * Water flow rate control * Water quality monitoring * Predator control * Sludge removal * De-clogging of drainage system * Cleaning of filters * Harvesting * Growth monitoring * Fingerling/fry grading * Marketing of hatchery products * Fish health monitoring * Fish propagation * Fish stocking * Fingerling packaging and transport   1. Fish safety and Bio security measures * Fencing * Proper Sourcing of feeds, fingerlings, brood stock * Predator control * Visitor Movement control * Quarantine and isolation   1. Husbandry practices * Feeding * Aeration * Water flow rate control * Water quality monitoring * Predator control * Sludge removal * De-clogging of drainage system * Cleaning of filters * Harvesting * Growth monitoring * Fingerling/fry grading * Marketing of hatchery products * Fish health monitoring * Fish propagation * Fish stocking   1. Fingerling packaging and transport   2. Fish stock harvesting   3. Fish cages maintenance   4. Fish cage records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage re-circulatory aquaculture | * 1. Design Recirculating Aquaculture System (RAS) * Bio-filters * Mechanical filters * Fish culture unit(s) * Water reservoir * Water drainage system * Water aeration system   1. Install Recirculating Aquaculture System   2. Bio safety measures   3. RAS management activities      + Cleaning of the unit      + De-clogging      + Water flow rate control      + Water aeration or oxygenation      + Fish feeding      + Water quality monitoring      + Predator control      + Sludge removal      + De-clogging of drainage system      + Cleaning of filters      + Harvesting      + Growth monitoring      + Fingerling/fry grading      + Marketing of hatchery products      + Fish health monitoring      + Fish propagation      + Fish stocking      + Fingerling packaging and transport | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended resources for 25 trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
| 1 | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
| 2. | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
| 3. | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
| 4. | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
| 5. | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
| 1. | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
| 2. | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
| 3. | Chain link fence | Surrounding fish pond | | 1 | | 1:25 | |
| 4. | Fish ponds | sufficient | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
| 1. | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
| 2. | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| * 1. .3. | water | sufficient | | 5 | | 2:5 | |
| * 1. 4. | Fishing nets |  | | 2 | | 2:25 | |
| * 1. 5. | Fish feeds | sufficient | | 5 | | 1:5 | |
| * 1. 6. | planktons | sufficient | | 5 | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
| 1. | Computers/Laptops | Any model | | | 1 | | 1:25 |
| 2. | Projector | LED.LCD, Laser | | | 5 | | 1:5 |
| 3. | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
| 4. | Laboratory | Well equipped | | | 1 | | 1:25 |
| * 1. 5. | Fishing line with hook | sufficient | | | 5 | | 1:5 |
| * 1. 6 | Buckets with lids | clean | | | 5 | | 1:5 |
| 7. | Jembe  Slasher  Spade  Rake | Sufficient | | | 5  5  5  5 | | 1:5  1:5  1:5  1:5 |
| * 1. 8. | Refrigerator |  | | | 1 | | 1:25 |
| * 1. 9. | Freezer box | any | | | 2 | | 2:25 |
| * 1. 10. | Sludge remover | any | | | 1 | | 1:25 |
| * 1. **F** | **Specimen** |  | | |  | |  |
| * 1. 1. | Fingerlings | From reputable hatcheries | | | sufficient | |  |

# 

**MODULE 5**

# INORGANIC AND ORGANIC CHEMISTRY

**UNIT CODE:** 0531 551 09A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply inorganic and organic chemistry

**DURATION OF UNIT: 120 Hours**

**UNIT DESCRIPTION**

This unit specifies the competencies required by an Animal Production Technologist Level 6 to apply inorganic and organic chemistry. It involves applying physical chemistry principles, inorganic and organic chemistry concepts.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Apply Physical chemistry principles | **40** |
|  | Apply Inorganic chemistry concepts | **40** |
|  | Apply Organic chemistry concepts | **40** |
| **Total** | | **120** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply physical chemistry principles | * 1. Properties of acids and bases   2. Properties of salts   3. Ionic and chemical equilibrium properties   4. Properties of Kinetics reactions   5. Properties of gases | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply inorganic chemistry concepts | * 1. Periodic table elements   2. Chemical bonds * Ionic bonds * Covalent bonds * Metallic bonds * Hydrogen bonds   1. Inorganic salts | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply organic chemistry concepts | * 1. Classes of organic compounds * Carbohydrates * Proteins * Lipids * Hydrocarbons   1. Physical properties of organic compounds * Colour * Hardness * Mass * Solubility * Density * Melting point   1. Chemical properties of organic compounds * pH * Chemical stability * Radioactivity * Flammability * Heat of combustion   1. Purification of synthesised organic compounds   2. Uses of purified organic compounds | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Demonstration
* Practical
* Discussions
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | Periodic table chart | | Well labeled | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | |  | |
|  | Laboratory consumable materials | Carbohydrates  Proteins  Lipids  Hydrocarbons  Acids and bases  Gases | | Sufficient | |  | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Computers/Laptops | Any model | | | 1 | | 1:25 |
|  | Projector | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Ph meter |  | | | 5 | | 1:5 |

# SOIL SCIENCE PRINCIPLES

**UNIT CODE:** 0811 551 12A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply soil science principles

**DURATION OF UNIT: 120 Hours**

**UNIT DESCRIPTION**

This unit specifies the competencies required to apply soil science principles. It includes competencies for performing soil sampling, analysis and improving soil fertility.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Perform soil sampling | **40** |
|  | Perform soil analysis | **40** |
|  | Improve soil fertility | **40** |
| **Total** | | **120** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Perform soil sampling | * 1. Personal protective equipment * Gloves * Gumboots * Safety googles * Overalls * Dust coats * Earmuffs * Face masks   1. Soil sampling and soil testing tools and equipment * Hoes * Machetes * Secateurs * Shovels * Soil augur * Panga * Hammer * Saw * Bucket * Shears * Dibbler * Pegs   1. Soil testing equipment * Digestion block * Kjeldahl apparatus * UV-VIS Spectrophotometer * Atomic absorption spectrophotometer (AAS) * Flame photometer * pH meter * EC meter * TDS meter * Fume chamber * Measuring cylinders * Assorted glassware for routine laboratory procedures * Mechanical stirrer   1. Soil sampling procedures * Field layout * Sample collection * Compositing * Packaging * Processing * Storage   1. Soil sample preparation | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform soil analysis | * 1. Personal protective equipment   2. Soil analysis equipment and materials   3. Processing of soil samples   4. Soil properties * Soil texture * Soil aggregation * Soil consistency * Soil colour * Soil moisture * Soil air * Soil bulk density * Water holding capacity * Soil pH * Soil EC * Cation exchange capacity * Percent base saturation * Salt index * Microbial activity * CN ratio   1. Preparation of soil analysis report | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Improve soil fertility | * 1. Personal protective equipment   2. Soil fertility * Characteristics of a fertile soil * Ways in which soil losses fertility   1. Fertilizers * Organic * Inorganic   1. Soil amendments * Fertilizers * Agricultural lime * Gypsum   1. Soil conservation measures * Cover cropping * Mulching * Strip cropping * Building of terraces * Minimum tillage * Contour ploughing | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Project
* Demonstration
* Practicals
* Discussions
* Direct instruction

**Recommended resources 25 students**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
| 1 | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
| 2. | Markers | | whiteboard markers and permanent markers  Felt pens | 5 | | 1:5 | |
| 3 | Computer laboratory | | Well equipped. | 25 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
| 4. | Lecture classroom | (9\* 8 sq. metres) | | 1 | | 1:25 | |
| 5. | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
| 6. | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
| 7. | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2.  Masking tapes  Notebooks  Text books | |  | | 1:5 | |
| 9. |  |  | |  | |  | |
| **D** | **Tools And Equipment** | | | | | | |
| 10. | Tools | Shovels  Jembes  Mattocks  Pangas  Water taps  Soil sampling packaging bags.  Ropes/ strings  Measuring tapes.  Pegs/ranging rods  Soil auger | | | 5  5  5  5  5  5  5  5  5  5  5 | | 1:5 |
| 12. | Projector | LED.LCD, Laser | | | 5 | | 1:5 |
| 13. | PH kits |  | | | 5 | | 1:25 |

# DRAUGHT ANIMALS MANAGEMENT

**UNIT CODE:**0811 551 25A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage draught animals.

**Duration of the unit: 80 Hours**

**UNIT DESCRIPTION**

This unit describes knowledge, skills and attitudes required to carry out camel, donkey and horse production. It involves carry out camel production, carry out donkey production and carry out horse production.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Carry out camel production | **30** |
|  | Carry out donkey production | **20** |
|  | Carry out horse production | **20** |
| **Total** | | **80** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 1. Carry out camel production | * 1. Camel production structures * Crushes * Milking parlour * Barn * Feeding facility * Camel shed * Camel dips * Feed storage facility   1. Identification methods * Ear tags * Ear notching * Branding * Neck chains * Straps with numbers * Ear tattooing   1. Construction materials for camel production structures * Timber * Iron sheets * Cement * Nails * Pipes   1. Tools and equipment for camel production.   2. Construction of camel production structures   3. Camel breeds * Dromendary * Bactrian * Somali * Rendille/ Gabbras * Turkana * Pakistani   1. Breed selection   2. Heat signs   3. Rutting signs   4. Camel breeding   5. Pregnancy diagnosis   6. Parturition management   7. Camel calf rearing   8. Milking methods and techniques   9. Routine management practices   10. Marketing of camel products and by-products   11. Camel production records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out Donkey production | * 1. Donkey farm layout   2. Donkey production structures * Crushes * Barn * Feeding facility * Donkey shed * Donkey dips * Feed storage facility   1. Identification methods * Ear tags * Ear notching * Branding * Neck chains S * Straps with numbers * Ear tattooing   1. Construction materials for donkey production structures * Timber * Iron sheets * Cement * Nails * Pipes   1. Tools and equipment for donkey production.   Construction of donkey production structures   * 1. Donkey breeds * East African * Maasai * Somalia   1. Breeding male selection   2. Heat signs   3. Donkey breeding * Natural * Artificial insemination * Embryo transfer   1. Pregnancy diagnosis   2. Parturition management   3. Donkey calf rearing   4. Milking techniques * Stripping method * Full hand method * Knuckling method * Machine milking   1. Routine management practices * Housing * Feeding * Hoof care * Dental care * Handling and Training * Record keeping * Deworming   1. Marketing of donkey products and by-products   2. Donkey production records | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out Horse production. | * 1. Horse rearing structures * Crushes * Barn * Feeding facility * Horse shed * Horse dips * Feed storage facility   1. Horse breeds and their characteristics * Light horses * Draft horses * Ponies * Gaited horses * Warmbloods   1. Breeding in horses   2. Selection of stallion and mare   3. Heat detection   4. Breeding methods * Natural * Artificial insemination * Embryo transfer   1. Pregnancy diagnosis   2. Pregnancy management   3. Foaling and foal management   4. Foaling weaning   5. Routine management practices * Housing * Feeding * Hoof care * Dental care * Handling and Training * Record keeping * Deworming   1. Bio-security practices * Fencing * Footbath * signage   1. Records management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group Discussions
* Direct instruction

**Recommended resources for 25 trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
| 1 | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
| 2. | Markers | | whiteboard markers and permanent markers | 50 | | 1:1 | |
| 3. | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
| 4. | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
| 5. | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
| 1. | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
| 2. | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
| 3. | 2 Crushes | Surrounding fish pond | | 1 | | 2:25 | |
|  | Milking parlour |  | | 1 | | 1:25 | |
|  | Barn |  | | 1 | | 1:25 | |
|  | Feeding facility |  | | 5 | | 1:5 | |
|  | Camel shed |  | | 1 | | 1:25 | |
|  | Feed storage facility |  | | 2 | | 2:25 | |
|  |  |  | |  | |  | |
| 4. |  | sufficient | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
| 1. | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
| 2. | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| * 1. .3. |  | sufficient | | 5 | | 2:5 | |
| * 1. 4. | Timber | any | | sufficient | |  | |
| * 1. 5. | Iron sheets | any | | sufficient | |  | |
| * 1. 6. | Cement | any | | sufficient | |  | |
| * 1. 7 | chemicals | * Insecticides | | sufficient | |  | |
|  |  | * Larvicides | | sufficient | |  | |
|  |  | * Rodenticides | | sufficient | |  | |
|  | * Lethal ovitraps | * Lethal ovitraps | | * Lethal ovitraps | | * Lethal ovitraps | |
| **D** | * Repellent | | | | | | |
| 1. | Computers/Laptops | Any model | | | 1 | | 1:25 |
| 2. | Projector | LED.LCD, Laser | | | 5 | | 1:5 |
| 3. | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
| 4. | Laboratory | Well equipped | | | 1 | | 1:25 |
| * 1. 5. | Ear tags | any | | | 5 | | 1:5 |
| * 1. 6 | Branding tool | any | | | 5 | | 1:5 |
| 7. | Neck chains | any | | | 5 | | 1:5 |
| * 1. 8. | Straps with numbers | any | | | 1 | | 1:25 |
| * 1. 9. | Ear tattooing tool | any | | | 2 | 2:25 | |
| * 1. 10. | Milking bucket  Milk strainer  Milk churn  Milk weighing scale  Milking salve  Strip cup | Steel  Steel  any  any | | | 5  5  5  2  3 | 1:25  1:25  1:25  2:12  3:8 | |
| * 1. **F** | **Specimen** |  | | |  |  | |

# EMERGING LIVESTOCK AND COMPANION ANIMALS MANAGEMENT

**UNIT CODE****:** 0811 551 26 A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage emerging livestock and companion animals

**Duration of the unit: 50 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to manage emerging livestock. It involves rearing of ostrich, rearing of quail, rearing of guinea fowls, farming of crocodile, and management of companion animals.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Carry out rearing of ostrich | **10** |
|  | Carry out rearing of quail | **10** |
|  | Carry out rearing of guinea fowls | **10** |
|  | Carry out rearing of crocodile | **10** |
|  | Carry out management of companion animals | **10** |
| **Total** | | **50** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 1. Carry out Ostrich rearing | * 1. Planning for ostrich farming      1. Research on; * Market, * Legal requirements, * Welfare requirements, * Potential challenges * Financial considerations before starting   + 1. Business plan development     2. Acquiring permits and licence     3. Species selection   1. Facilities and equipment for ostrich farming   + Land   + Shelter   + Fencing   + Feeding and watering systems   + Handling facilities   1. Ostrich Breeding management   2. Hatching and chicks care * Egg collection * Incubation   1. Routine management practices * Started diet * Vaccination * Parasite control   1. Marketing of ostrich and their products   2. Bio-security practices   3. Waste management   4. Record maintenance | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out Quail rearing | * 1. Planning for quail farming   2. Facilities and equipment for rearing quail   3. Breeding management   4. Hatching and chick performance   5. Routine management   6. Quails and products marketing   7. Bio-security practices   8. Waste management   9. Records maintenance | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out Guinea Fowls rearing | * 1. Planning for Quinea fowl farming   2. Preparation of facilities and equipment for Guinea fowl rearing   3. Breeding management      1. Breeding stock selection      2. Breeding ratio      3. Egg collection      4. Egg incubation      5. Brooding   4. Hatching and chicks care   5. Routine management practices   6. Guinea fowls and products marketing   7. Bio-security practices   8. Waste management   9. Quil record maintenance | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out crocodile rearing | * 1. Crocodile farming planning   2. Preparation of facilities and equipment for crocodile farming   3. Breeding management      1. Feeding      2. Grading and segregation      3. Monitoring progress      4. Health care provision      5. Breeding stock selection   4. Hatching care      1. Egg collection      2. Incubation      3. Started diet      4. Vaccination      5. Parasite control   5. Routine management   6. Crocodile breeding methods and technologies      1. Breeding methods (natural breeding or hormone induced)   7. Bio-security practices      1. Fencing      2. Vaccination      3. Movement control      4. Depopulation   8. Waste management   9. Records management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Carry out management of companion animals | * 1. Determination of nutrient requirements of dogs and cats   2. Feeding of dogs and cats based on nutritional requirements   3. Feeding regime/schedule for dogs and cats      1. Feeding based on age – puppies/kittens, adult dogs/cats, senior dogs/ cats      2. Feeding based on breeds – giant breeds, active breeds      3. Feeding based on health status – weight management, medical conditions      4. Feeding based on type of food – dry, wet, raw food diets      5. Feeding schedule consistency      6. Fresh water availability   4. Breeding management of dogs and cats      1. Animal selection      2. Health checks      3. Breeding age      4. Heat cycles (females)      5. Stud selection      6. Mating methods (natural/artificial insemination)      7. Pregnancy and whelping/kittening   5. Management of pregnant dogs and cats      1. Prenatal care      2. Whelping/kittening box preparation      3. Delivery monitoring      4. Postnatal care   6. Parturition preparation   7. Management of puppies and kittens      1. Monitoring weight gain,      2. Keeping them warm and clean,      3. Stimulating elimination in young pups/kittens      4. Vaccination      5. Deworming      6. Early socialization   8. Housing of dogs and cats   9. Routine management practices in dogs and cats   10. Record management | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration
* Group work and Discussions
* Direct instruction

**Recommended resources for 25 trainees**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) |
| **A** | **Learning Materials** | | | | | |
| 1 | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 |
| 2. | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 |
| 3. | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 |
| 4. | Newspapers and Handouts | | Daily | 25 | | 1:1 |
| 5. | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 |
| **B** | **Learning Facilities & Infrastructure** | | | | | |
| 1. | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 |
| 2. | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 |
| 3 | Barn |  | | 1 | | 1:25 |
| 4 | Feeding facility |  | | 5 | | 1:5 |
| 5 | Feed storage |  | | 1 | | 1:25 |
| **C** | **Consumable Materials** | | | | | |
| 1. | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 |
| 2. | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 |
| * 1. .3. |  | sufficient | | 5 | | 2:5 |
| * 1. 4. | Timber | any | | sufficient | |  |
| * 1. 5. | Iron sheets | any | | sufficient | |  |
| * 1. 6. | Cement | any | | sufficient | |  |
| * 1. 7 | Nails | Sufficient | | Sufficient | |  |
|  | Pipes | sufficient | | sufficient | |  |
| **D** | **Equipment** | | | | | |
| 1. | Computers/Laptops | Any model | | | 1 | 1:25 |
| 2. | Projector | LED.LCD, Laser | | | 5 | 1:5 |
| 3. | Whiteboard | Glass, melamine, porcelain | | | 1 | 1:25 |
| * 1. **F** | **Specimen** |  | | |  |  |
| * 1. **1.** | **crocodile** |  | | | **2** | **2:25** |
| * 1. **2.** | **ostrich** |  | | | **2** | **2:25** |
| * 1. **3.** | **Guinea foul** |  | | | **2** | **2:25** |
| * 1. **4** | **cat** |  | | | **2** | **2:25** |
| * 1. **5** | **dog** |  | | | **2** | **2:25** |

# MODULE 6

# GENETIC CONCEPTS

**UNIT CODE****:** 0511 551 08 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply genetic concepts

**DURATION OF UNIT: 80 Hours**

**UNIT DESCRIPTION**

This unit describes knowledge, skills and attitudes required to apply genetic concepts. It involves applying Mendelian and chromosomal theories in theory in agricultural production. It also involves illustrating genetic mutations in agricultural production.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Apply Chromosomal theory | **20** |
|  | Apply Mendelian theory | **30** |
|  | Apply Genetic mutation | **30** |
| **Total** | | **80** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply Chromosomal theory | * 1. Identification and illustration of chromosome structure      1. DNA      2. Proteins      3. Centromere   2. Identification and illustration of DNA structure   3. Role of DNA   4. Cell division stages      1. Interphase      2. Prophase      3. Metaphase      4. Anaphase      5. Telophase | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Mendelian theory | * 1. Variation in animal breeding   2. Monohybrid inheritance   3. Dihybrid inheritance   4. Complete dominance   5. Co-dominance   6. Incomplete dominance   7. phenotypes and genotypes illustrations   8. Identification and illustration of phenotypic frequencies | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply Genetic mutation | * 1. Causes of mutations      1. Radioactive rays      2. Chemicals      3. Infectious agents   2. Types of mutation      1. Chromosomal mutation      2. Gene mutation   3. Mutational disorders      1. Hypotrichosis      2. Beta-man      3. Osteoporosis      4. Pulmonary hypoplasia | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Demonstration
* Practical
* Discussion
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 50 | | 1:1 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Computers/Laptops | Any model | | | 1 | | 1:25 |
|  | Projector | LED.LCD, Laser | | | 1 | | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |

# BIOCHEMISTRY PRINCIPLES

**UNIT CODE:** 0512 551 10 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply biochemistry principles

**Duration of unit: 60 hours**

**UNIT DESCRIPTION**

This unit specifies the competencies required by an animal production technologist level 6 to apply biochemistry principles. It involves measuring enzyme kinetics, analyzing carbohydrates, proteins, lipids, vitamins and minerals.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Measure Enzyme kinetics | **10** |
|  | Analyze carbohydrates | **15** |
|  | Analyze proteins | **10** |
|  | Analyze lipids | **10** |
|  | Analyze Minerals and vitamins | **15** |
| **Total** | | **60** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Measure Enzyme kinetics | * 1. Enzyme and substrate preparation   2. Enzyme assay   3. Measurement of enzyme reaction rate | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Analyze carbohydrates | * 1. Identification of carbohydrates   2. Classification of carbohydrates based on chemical composition      1. Monosaccharide’s      2. Disaccharides      3. Polysaccharides      4. Oligosaccharides   3. Classification of carbohydrates based on chemical structure   4. Functions of carbohydrates | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Analyze proteins | * 1. Identification of proteins   2. Classification of proteins   3. Functions of proteins | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Analyze lipids | * 1. Identification of lipids      1. Phospholipids      2. Triglycerides      3. Sphingolipids      4. Steroids   2. Classification of lipids   3. Functions of lipids | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Analyze Minerals and vitamins | * 1. Identification of minerals and vitamins   2. Functions of minerals      1. Macro elements      2. Micro elements   3. Functions of vitamins      1. Water soluble vitamins      2. Fat soluble vitamins | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Demonstration
* Practicals
* Discussions
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | Periodic table chart | | Well labeled | 5 | | 1:5 | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. meters) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | Chemistry laboratory | Well-equipped laboratory | | 1 | | 1:25 | |
| **C** | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
|  | Laboratory consumable materials | Carbohydrates  Proteins  Lipids, vitamins  Hydrocarbons  Acids and bases  Gases | | Sufficient | |  | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Computers/Laptops | Any model | | | 1 | | 1:25 |
|  | Projector | LED.LCD, Laser | | | 5 | | 1:5 |
|  | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Ph meter |  | | | 5 | | 1:5 |

# FARM MANAGEMENT PRINCIPLES

**UNIT CODE:** 0811 551 11 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply farm management principles

**DURATION OF UNIT: 60 Hours**

**UNIT DESCRIPTION**

This unit specifies competencies required to apply farm management principles**.** It involves Apply farm planning techniques, control farm operations, manage farm resources and Organize farm operations.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Apply farm planning techniques | **15** |
|  | Control farm operations | **15** |
|  | Manage farm resources | **15** |
|  | Organize farm operations | **15** |
| **Total** | | **60** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply farm Planning techniques | * 1. Goals and objectives of livestock enterprise   2. Organization plans * Strategic plan * Tactical plan * Operational plan * Working plan   1. Resources required to achieve the goals in livestock farm   + Human   + Financial   + Agricultural machines   + Agricultural inputs | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Control farm operations | * 1. Employees motivation to achieve organizational objectives   2. Leadership styles incorporation in workplace   + Authoritarian Leadership   + Democratic Leadership   + Transformational Leadership   + Laissez-Faire Leadership   1. Evaluation of plan and adjustment to ensure organizational goals are conducted   2. Capacity building of the employees   3. Performance appraisals   + Straight ranking appraisals   + Grading   + Management by objective appraisals   + Behavior-based appraisal   + Performance appraisal   1. Resource adjustments   + Budget   + Staff | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Manage farm resources | * 1. Assessment of corporate social responsibilities and cultural opportunities   2. Costs and pricing of the livestock farm enterprise   3. Conducting Quality control and customer service   4. Direction of resources | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Organize farm operations | * 1. Perform resource distribution   2. Achieve establish goals   3. Budgeting farm enterprise   4. Staffing of workers * Advertisement of vacant * Shortlisting * Interview * Recruitment * Training * Motivation | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Demonstration
* Practicals
* Discussions
* Direct instruction

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/No.** | **Category/Item** | | **Description/ Specifications** | **Quantity** | | **Recommended Ratio**  (Item: Trainee) | |
| **A** | **Learning Materials** | | | | | | |
|  | Charts | | Flip Charts  Rules and Regulations | 5 | | 1:5 | |
|  | Markers | | whiteboard markers and permanent markers | 5 | | 1:5 | |
|  | Video clips  Audio tapes | | MP4, MP3 | 5 | | 1:5 | |
|  | Newspapers and Handouts | | Daily | 25 | | 1:1 | |
|  | Business Journals | | Annual, Monthly, Daily | 25 | | 1:1 | |
|  | Agricultural inputs | |  |  | |  | |
| **B** | **Learning Facilities & Infrastructure** | | | | | | |
|  | Lecture/Theory Room | (9\* 8 sq. metres) | | 1 | | 1:25 | |
|  | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | | 1 | | 1:25 | |
|  | **Consumable Materials** | | | | | | |
|  | Flashcards | Alphabet, Numbers, Math | | 25 | | 1:1 | |
|  | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | | 5 reams | | 1:5 | |
| **D** | **Tools And Equipment** | | | | | | |
|  | Computers/Laptops | Any model | | | 1 | | 1:25 |
|  | Projector | LED.LCD, Laser | | | 1 | | 1:25 |
|  | Whiteboard | Glass, melamine, porcelain | | | 1 | | 1:25 |
|  | Agricultural machines | Tractors, plough, seeders, Planters, Harrows, Tillers | | |  | |  |

**GEOGRAPHICAL INFORMATION SYSTEM**

**UNIT CODE:** **0532 551 13 A**

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply geographical information system.

**Duration of Unit: 40 Hours**

**Unit Description**

This unit covers the competencies required to apply information systems it involves Applying GIS and remote sensing techniques, performing geo-graphic communication and, producing geo-maps.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Apply GIS and remote sensing techniques | **10** |
|  | Perform geo-graphic communication | **20** |
|  | Produce geo-maps | **10** |
| **Total** | | **40** |

**Learning Outcomes, Content, and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply GIS and remote sensing techniques | * 1. Objectives and guiding principles   2. Management of ecosystems and sustainable natural resource   3. Environmental stewardship   4. Environmental quality and health   5. Environmental governance laws | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform geo-graphic communication | * 1. Developing digital maps as per Open Geospatial Consortium   2. Presenting digital maps as per Open Geospatial Consortium   3. Generating graphs as per Open Geospatial Consortium   4. Image geo-referencing and processing as per Open Geospatial Consortium   5. Generation of digital models as per Open Geospatial Consortium | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Produce geo-maps | * 1. Generation of maps per Federal Geographic Data Committee   2. Compilation and design of maps as per Federal Geographic Data Committee   3. Projection of coordinate reference maps systems as per Federal Geographic Data Committee | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Project
* Demonstration
* Practicals
* Discussions
* Direct instruction

**Recommended Resource for 25 trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No** | **Item/Category** | **Description/Specification** | **Quantity** | **Recommended Ratio**  **(Item: Trainee)** |
| A | **Learning Materials** |  |  |  |
|  | Text books and  E-Learning materials | Survey and statistic books | 5 | 1:5 |
| B | **Learning Facilities & infrastructure** |  |  |  |
|  | classroom |  | 1 | 1:25 |
| C | **Consumable materials** |  |  |  |
|  | notebooks | A4 SIZE | 25 | 1:1 |
|  | Flip chart |  | 1 | 1:25 |
| D | **Tools and Equipment** |  |  |  |
|  | Projectors | EPSON 2788 LUMEN | 1 | 1:25 |
|  | Computers | Any brand-5th generation and above COi5 | 5 | 1:5 |
|  | internet | Reliable and fast |  |  |
|  | GPS device |  | 5 | 1:5 |

# CONDUCT SCIENTIFIC RESEARCH

**UNIT CODE:** 0111 551 14 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Conduct Scientific Research

**Duration of Unit: 80 Hours**

**UNIT DESCRIPTION**

This unit specifies the competencies required to conduct scientific research**.** It involves preparing scientific research proposal, carrying out laboratory research, analyzing the laboratory research findings and documenting and disseminating laboratory research findings.

**Summary of Learning Outcomes**

By the end of this unit, the learner should be able to:

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Prepare scientific research proposal | **30** |
|  | Apply scientific research methods | **20** |
|  | Analyze scientific research finding | **30** |
| **Total** | | **80** |

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Prepare scientific research proposal | * 1. Identification of scientific research problem   2. Development of research objectives   3. Designing research questions   4. Development of scientific research proposals as per standard research procedures | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply scientific research methods | * 1. Determining Scientific study design      1. Qualitative design      2. Quantitative design   2. Determining of sample size   3. Determine sampling techniques      1. Probability      2. Non probability   4. Ethical considerations in research   5. Identifying research materials   6. Data collection | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |
| 1. Analyze scientific research finding | * 1. Identifying data analysis methods      1. ANOVA      2. Measures of central tendency      3. Measures of dispersal   2. Perform data analysis   3. Prepare research report | * Written assessment * Practical * Projects * Third party report * Portfolio of evidence * Oral questions |

**Suggested methods of delivery**

* Practical
* Project
* Demonstration by trainer
* Practice by the trainee
* Group work and Discussions
* Direct instruction

**Recommended Resources**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Material** | **Quantity** | **Ratio of use.** |
| 1. | Workstation | 5 | 1:5 |
| 2. | Reporting tools | several | 1:1 |
| 3 | Data collection tools (ANOVA software) | 5 | 1:5 |
| 4 | Stationery |  |  |
| 5 | Data analysis tools |  |  |
| 6 | PPEs |  | individually |
| 8 | Text book resource for research |  | individually |
| 9 | Computer (MS word, excel and PowerPoint) |  | individually |
| 10 | Smart phones |  | individually |
| 11 | Internet | WIFI | 1:25 |
| 12. | Whiteboards | 1 | 1:25 |