

**REPUBLIC OF KENYA**

**COMPETENCY BASED MODULAR CURRICULUM**

**FOR**

**APIARY ATTENDANCE**

**KNQF LEVEL 4**

**PROGRAMME ISCED CODE:** **0811 354 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 Agricultural Sector’s growth and development.

**PRINCIPAL SECRETARY**

**STATE DEPARTMENT FOR TVET**

**MINISTRY OF EDUCATION**

**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 up skilling.

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 ………….. National Sector Skills Committee (NSSC) in ensuring that competencies required by the industry are addressed in the curriculum. I also thank all stakeholders in the Agricultural 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 Agricultural Sector acquire competencies to perform their work more efficiently and effectively.

**ACRONYMS** **AND ABBREVIATIONS**

|  |  |
| --- | --- |
| PPEs | Personal Protective Equipment |
| ISCED | International Standard Classification of Education |
| TVET | Technical and vocational education and training |
| TVETA | Technical and Vocational Education Training Authority |
| KTBH | Kenya top bar hive |

**KEY TO 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

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**COURSE OVERVIEW**

Apiary Attendance level 4 qualification consists of competencies an individual must have to operate duties of an apiary attendant**.** It involves carrying out apiary establishment, managing apiary and harvesting bee products. It also involves bee biology, bee behavior, safety and hygiene in bee handling.

Units of learning comprising Apiary attendance level 4 qualification include the following:

**MODULAR UNIT SUMMARY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UNIT OF COMPETENCY** | **Unit Code** | **Units Title** | **Unit Duration (Hours)** | **Credit Factor** |
| **MODULE I** | | | | |
| Core | 0811 341 01 A | Apiary establishment | 150 | 15 |
| Core | 0811 341 02 A | Apiary Management | 150 | 15 |
| Core | 0811 341 03 A | Bee products harvesting | 150 | 15 |
|  |  | **TOTAL** | **450** | **45** |
| **MODULE II** | | | | |
| Common | 0811 341 04 A | Bee biology | 80 | 8 |
| Common | 0811 341 05 A | Bee behavior in bee handling | 80 | 8 |
| Common | 1022 341 06 A | Safety and hygiene | 100 | 10 |
| **Industry Training** | | | **320** | **32** |
| **GRAND TOTAL** | | | **1030** | **103** |

**Entry Requirements**

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

1. Kenya Certificate of Secondary Education (KCSE) , KCE Div. IV, or completion of KNQF level 3

**Or**

1. Apiary attendance level 3 or its equivalent as determined by TVET Authority

**Trainer Qualification**

A trainer for any of the units of competency in this course must:

1. A trainer for this course must have graduated in apiary attendance level 5, or any other related qualification.
2. Must be registered with TVETA.

**Industry Training**

An individual enrolled in this course will be required to undergo Industry training for a minimum period of 320 hours in the agriculture sector. The industrial training may be undertaken after completion of all units for those pursuing part qualification or be distributed equally in each unit for those pursuing partial qualification. In the case of dual training model, industrial training shall be as guided by the dual training policy

**Assessment requirements**

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. Assessment of basic and common competencies shall be integrated in the core units
4. Theoretical assessment shall be integrated in practical assessment and conducted orally in both formative and summative assessments.
5. Theoretical and practical weight shall be 10:90 respectively for each unit of learning.
6. Formative and summative assessments shall be weighted at 60% and 40% respectively in the overall unit of learning score
7. 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 the certificate of competency upon demonstration of competence in a unit of competency. To be issued with the Kenya National TVET Certificate in Apiary Attendance level 4, 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 I**

**APIARY ESTABLISHMENT**

**UNIT CODE:** **0811 341 01 A**

**UNIT DURATION: 150** Hours

**Relationship to Occupational Standard**

This unit addresses the Unit of Competency: Carry out apiary establishment

**Unit Description**

This unit covers the competencies required to carry out apiary establishment. It involves selecting apiary site, preparing apiary site, constructing bee house, installing bee hives and stocking bee hives.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Select Apiary Site | 30 |
| 2. | Prepare Apiary Site | 30 |
| 3. | Construct Bee house | 30 |
| 4. | Install bee hives | 30 |
| 5. | Stock bee hives | 30 |
| **Total** | | **150** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| Select apiary site | * 1. PPEs      1. Types * Gumboot * Gloves * Overall * Dust coats * Bee suit   + 1. Uses     2. Maintenance     3. Importance   1. farm layout design   2. apiary sight identification   3. Site selection records | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 2. Prepare apiary site | * 1. PPEs   2. Apiary site preparation Tools, equipment and materials      1. Jembe      2. Monkey strainer      3. Hammer      4. Tape measure      5. Slasher      6. Rake      7. Hand saw   3. Apiary site clearing   4. Apiary site levelling   5. Apiary site demarcation   6. Site preparation records   7. Management of farm waste | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 3. Construct bee house | 3.1 PPEs  3.2 Tools, equipment and materials used  3.3 bee house layout  3.3.1 Factors affecting size of bee house   * Size of land * Materials available * Availability of capital   3.4 Bee house construction  3.5 bee house construction records  3.6 bee house waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 4. Install bee hives | 1. PPEs 2. Tools, equipment and materials   4.2.1 Monkey strainer  4.2.2 Hammer  4.2.3 Tape measure  4.2.4 Hand saw  4.2.5 Chain link  4.2.6 Barbed wire  4.2.7 Poles  4.2.8 Nails  4.3 Types of Bee hives  4.3.1 Langstroth bee hive  4.3.2 Kenya Top Bar Hive (KTBH)  4.3.3 Log hive  4.4. Bee hives cleaning  4.5 Bee hives labelling  4.6 Bee hives baiting  4.7 Bee hives stand fixing  4.8 Bee hives suspension  4.9 Bee hives installation records  4.10 Waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 5. Stock bee hives | * 1. PPEs   2. Tools, equipment and materials      1. Beehive components      2. Protective Gear      3. Hive tool      4. Smoker      5. Bee brush      6. Feeding equipment   3. Trapping a bee swarm   4. Bee lures and attractants      1. Pheromones      2. Old comb and wax      3. Honey or sugar water      4. Floral scents      5. Bee colonies         1. Queen         2. Worker bees         3. Drones   5. Colony divisions   6. Stoking records   7. Waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Practical
* Direct instruction
* Group discussion
* Demonstrations
* Project-Based Learning (PBL)

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/no** | **Tools and Equipment** | **Specification** | **Quantity** | **Ratio** |
|  | Tape measure |  | 15 | 1:2 |
|  | Level |  | 15 | 1:2 |
|  | Hive tool |  | 15 | 1:2 |
|  | Smoker |  | 15 | 1:2 |
|  | Bee brush |  | 15 | 1:2 |
|  | Feeding equipment |  | 25 | 1:1 |
|  | Timber |  |  |  |
|  | Nails |  |  |  |
|  | Hammer |  | 25 | 1:1 |
|  | Tape measure |  | 15 | 1:2 |
|  | Hand saw |  | 15 | 1:2 |
|  | Chain link |  |  |  |
|  | Barbed wire |  |  |  |
|  | Beehive components |  |  |  |
|  | sweep nets |  | 15 | 1:2 |
|  | Feeders |  |  |  |
|  | Water source |  |  |  |
|  | Sugar, syrup, honey |  |  |  |

**APIARY MANAGEMENT**

**UNIT CODE: 0811 341 02 A**

**UNIT DURATION: 150** Hours

**Relationship to Occupational Standard**

This unit addresses the Unit of Competency: Manage Apiary

**Unit Description**

This unit covers the competencies required to manage an apiary. It involves managing bee forage resources; carrying out bee feeding; inspecting bee hives and controlling bee pests and diseases.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Manage bee forage resources | 30 |
| 2. | Carry out bee feeding | 30 |
| 3. | Inspect bee hives | 30 |
| 4. | Control bee pests and diseases | 30 |
| 5. | Perform hygiene and sanitation | 30 |
| **Total** | | **150** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| Manage bee forage resources | **Theory**   * 1. PPEs      1. Types * Gumboot * Gloves * Bee suit * Dust coat * Overall   + 1. Uses     2. Maintenance     3. Importance   1. Tools and equipment      1. Types      2. Uses      3. Maintenance      4. Importance   1.3Bee forages   * + 1. Mountain mint     2. Purple coneflower     3. Summer flox     4. Wood mint     5. Sunflower     6. Rosemary     7. Citrus trees     8. Avocado     9. Key apple     10. Eucalyptus     11. Passion     12. Bananas     13. Acacia species     14. Cucumber     15. Pumpkin     16. Bottle brush     17. Neem tree     18. Calliandra spp     19. Coffee     20. Croton spp     21. Sisal     22. Maize     23. Mango tree     24. Leucena     25. Prosopis     26. Dombeya     27. Clover   1. Bee forage establishment   2. Bee forage calendar   3. Bee forage conservation   4. Bee forage resources records   5. Bee forage waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 2. Carry out bee feeding | 1. PPEs 2. Artificial bee feeds    * 1. Fruit juices      2. Sucrose solution   2.3 Water provision  2.4 Bee feeding records  2.5 Waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 3. Inspect bee hives | * 1. PPEs   2. Tools, equipment and materials      1. Smoker      2. Hive tool      3. Bee brush   3. Bee hive external inspection   4. Bee hive smoking   5. Beehive opening   6. Inspection of bees and combs   7. Closing of the Hive   8. Inspection Record   9. Inspection waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 4. Control bee pests and diseases | 4.1 Inspection of bee and combs  4.2 Bee pests control measures  4.2.1 Bee pests   * Varroa mites * Wax moths * Small hive beetles * Tracheal mites   + 1. bee pest control measures * Trapping active moths * Destruction of egg, larvae and pupa * Removing infested combs * Fumigating bee hives   1. Bee diseases and control measures      + American foulbrood      + European Foulbrood      + Nosema      + Bee paralysis virus      1. Bee diseases Control measures      + Apiary sanitation      + Avoid disposal of hive materials      + Hive inspection   2. Bee pests and disease records   3. Bee hive waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 1. Perform hygiene and sanitation | 1. Cleaning and disinfection of feeders and drinkers 2. Disposal of affected hives and bees and combs 3. Hygiene and sanitation records 4. Waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Direct instruction
* Project-Based Learning (PBL)
* Practical
* Group discussion
* Demonstrations

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| s/no | Items | Specification | quantity | ratio |
|  | Lecture room |  | 1 | 1:25 |
|  | Computer |  | 1 | 1:25 |
|  | Projector |  | 1 | 1:25 |
|  | Bee forage farm ¼ | With bee forage | 1:25 | 1:25 |
| 5. | Hive tool |  | 15 | 1:2 |
| 6. | Smoker |  | 15 | 1:2 |
| 7. | Bee brush |  | 15 | 1:2 |

**BEE PRODUCTS HARVESTING**

**UNIT CODE: 0811 341 03 A**

**UNIT DURATION: 150** Hours

**Relationship to Occupational Standard**

This unit addresses the Unit of Competency: Harvest bee products

**Unit Description**

This unit covers the competencies required; it involves in conduct pre-harvesting practices, perform bee product harvesting, extract bee honey and perform post-harvest practices.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Conduct pre-harvesting practices | 50 |
| 2. | Perform bee product harvesting | 30 |
| 3. | Extract bee honey | 40 |
| 4. | Perform post-harvest practices | 30 |
| **Total** | | **150** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| Conduct pre-harvesting practices | * 1. PPEs      1. Types      + Gumboot      + Gloves      + Bee suit      1. Uses      2. Maintenance      3. Importance   2. Bee hive handling Tools and equipment      1. Types      + Hive tool      + Swarm net      + Bee brush      + Bee smoker      + Honey extractor      + Queen excluder      1. Uses      2. Maintenance      3. Importance   3. Bee colonies for harvesting      1. Queen      2. Worker bees      3. Drones   4. Bee products      1. Honey      2. Wax      3. Propolis      4. Bee venom      5. Royal jelly   5. Bee products harvesting schedule   6. Bee products pre-harvesting records Practice | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 2. Perform bee product harvesting | 1. Persona; protective equipment 2. Tools and equipment 3. Bee products harvesting 4. Harvesting records 5. Waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 3. Extract bee honey | * 1. PPEs   2. Tools and equipment   3. Honey combs decaping   4. Bee honey extraction   5. Honey Production record   6. Honey extraction waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 4. Perform post-harvest practices | * 1. PPEs   2. Bee handling tools and equipment   3. Returning of Langstroth super boxes   4. Sieving of extracted bee honey   5. Post-harvest records   6. Post-harvest waste management | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Direct instruction
* Practical
* Demonstration
* Project-Based Learning (PBL)
* Group discussion

**Recommended Resources for 25 Trainees**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tools and Equipment** | **Specification** | **Quantity** | **Recommended ratio** |
| Bee smoker |  | **5** | **1:5** |
| Bee brush |  | **5** | **1:5** |
| Swarm net |  | **5** | **1:5** |
| Hive tool |  | **5** | **1:5** |
| Honey extractor |  | **2** | **1:13** |
| Queen excluder |  | **5** | **1:5** |
| Notebook for observations |  | 1 | 1:25 |
| Textbooks |  | 5 pcs | 1:5 |
| Charts |  |  |  |
| Power point presentations | For trainer’s use |  |  |
| Lecture/theory room |  | 1 | 1:25 |
| Workshop |  | 1 | 1:25 |
| Laboratory |  | 1 | 1:25 |
| Site |  | 1 | 1:25 |

**MODULE II**

**BEE BIOLOGY**

**UNIT CODE: 0811 341 04A**

**UNIT DURATION:** 80 Hours

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply bee biology knowledge

**Unit Description**

This unit covers the competencies required to apply bee biology knowledge. It involves identifying bee species, applying knowledge of bee lifecycle and caste and applying knowledge of bee external anatomy.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Identify bee species | 30 |
| 2. | Apply knowledge of bee lifecycle and caste | 30 |
| 3. | Apply knowledge bee external anatomy | 20 |
| **Total** | | **80** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 1. Identify bee species | * 1. Introduction to bees      1. Importance of bees      2. Types of bee species         1. Honeybees (Apis) species * Apis mellifera * Apis florea * Apis dorseta   + - 1. Bumblebees (Bombus       2. Solitary Bees       3. Sweat Bees (Halictidae)   1. Honey bees sub species * Carniolan honey bee * Apis mellifera simensis * Apis mellifera adansonii * East African lowland honey bee * European dark bee * Caucasian honey bee   1. Races of honeybees * European honey bee * African wild bee * Italian honey bee * German black bee | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 2. Apply knowledge of bee lifecycle and caste | * 1. Bee castes / Bee colony      1. Queen      2. Workers (Nurse Bees, Foragers, House Bee and Guard Bees)      3. Drone      4. Brood   2. Bee developmental stages   3. Bee life cycle | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 3. Apply bee external anatomy | 3.1 Queen bee external anatomy  3.2 Drone bee external anatomy  3.3 Worker bee external anatomy | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Group discussion
* Project
* Direct instruction
* Project-Based Learning (PBL)
* Demonstrations

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **s/no** | **Items** | **Specifications** | **Quantity** | **Ratio** |
| **1.** | Lecture room |  | **1** | **1:25** |
| **2.** | Projector |  | **1** | **1:25** |
|  | Laptop |  | **1** | **1:25** |
|  | Forceps |  | **5** | **1:5** |
|  | Sweep nets |  | **15** | **1:2** |
|  | identification charts |  | **15** | **1:2** |
|  | killing insect bottles |  | **15** | **1:2** |
|  | mounting boards |  | **15** | **1:2** |
|  | mounting pins |  | **50** | **2:1** |
|  | Colonised bee hives |  | **5** | **1:5** |

**BEE BEHAVIOR**

**UNIT CODE:** **0811 341 05 A**

**UNIT DURATION:** 80 Hours

**Relationship to Occupational Standard**

This unit addresses the Unit of Competency: Apply bee behavior in handling bees

**Unit Description**

This unit covers the competencies required to apply bee behavior in handling bees. It involves applying knowledge of bee communication behavior, reproductive bee behavior and bee swarming behavior.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Apply knowledge of bee communication behavior | 30 |
| 2. | Apply knowledge of reproductive bee behavior | 30 |
| 3. | Apply bee swarming behavior | 20 |
| **Total** | | **80** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 1. Apply knowledge of bee communication behaviour | * 1. Bee communication behaviour      1. Dances      2. Pheromones   2. Conflict resolution using bee communication behaviour   3. Colony strengthening using bee communication behaviour   4. Colony unit defense using bee communication behaviour | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply knowledge of reproductive bee behaviour | 1. Bee reproductive behaviour in bee colony management 2. Bee reproductive behaviour in breeding   2.3 Bee reproductive behaviour in control of inbreeding | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 3. Apply knowledge of bee swarming behavior | 3.1 Bee swarming behavior  3.1.1 Reasons for swarming  3.1.2 Signs of swarming  3.1.2 Stages for swarming  3.1.2 Control for swarming  3.2 Bee swarming behavior in colonies management  3.3 Bee swarming behavior in colony division | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Group discussion
* Project
* Direct instruction
* Project-Based Learning (PBL)
* Demonstrations

**Recommended Resources for 25Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **s/no** | **Items** | **Specifications** | **Quantity** | **Ratio** |
| **1.** | Lecture room |  | **1** | **1:25** |
| **2.** | Projector |  | **1** | **1:25** |
| **3** | Laptop |  | **1** | **1:25** |
| **4** | Forceps |  | **5** | **1:5** |
| **5** | Sweep nets |  | **15** | **1:2** |
| **6** | identification charts |  | **15** | **1:2** |
| **7** | killing insect bottles |  | **15** | **1:2** |
| **8** | mounting boards |  | **15** | **1:2** |
| **9** | mounting pins |  | **50** | **2:1** |
|  | Colonised bee hives |  | **5** | **1:5** |

**SAFETY AND HYGIENE**

**UNIT CODE: 1022 341 06 A**

**UNIT DURATION: 100** Hours

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply Bee Product Safety and Hygiene

**Unit Description**

This unit covers the competencies required to apply bee product safety and hygiene. It involves applying knowledge of apiary attendant safety, hygiene and bee product safety and hygiene

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Apply knowledge of apiary attendant safety | 50 |
| 2. | Apply knowledge apiary attendant hygiene | 30 |
| 3. | Apply knowledge of bee products safety and hygiene | 20 |
| **Total** | | **100** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| * + - 1. Apply knowledge of apiary attendant safety | * 1. PPEs   1.1.1 bee suit  1.1.2 gloves  1.1.3 gumboots   * 1. Bee behaviour and communication   2. Bee handling   3. First aid | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |
| 1. Apply knowledge of apiary attendant hygiene | 1. Personal grooming    1. Nail care    2. Bathing    3. Hair care    4. Avoid perfumes    5. Hand washing 2. Personal clothing    * 1. Wearing white dust coat      2. Donning hair net      3. Wearing clean clothes 3. Public health regulations in bee product handling | * Practical assessments * Written tests * Third party report * Interviews/ Oral questions * Portifolio of evidence review |
| 1. Apply knowledge of bee products safety and hygiene | * 1. cleaning and sanitation procedures      1. Cleaning in place      2. Cleaning out of place.   2. personal hygiene operations   3.2.1 Wearing PPEs  3.3.2 General cleanliness  3.3.3 Personal grooming  3.3.5 Staff vaccination  3.3 clean and sanitation efficiency  3.4 bee product hygiene records | * Practical * Project * Written tests * Third party report * Portfolio of evidence * Oral questions |

**Suggested Methods of Instruction**

* Direct instruction
* Practical
* Demonstrations
* Group discussion
* Project-Based Learning (PBL)

**Recommended Resources for 25 Trainees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/NO** | **Items** | **Specifications** | **Quantity** | **Ratio** |
|  | Lecture room |  | 1 | 1:25 |
|  | Projecter |  | 1 | 1:25 |
|  | Laptop |  | 1 | 1:25 |
|  | Brooms |  | 15 | 1:2 |
|  | Moppers |  | 15 | 1:2 |
|  | Dusters |  | 15 | 1:2 |
|  | Sponges |  | 15 | 1:2 |
|  | detergents |  | 250L | 10:1 |
|  | hand sanitizer |  | 50L | 5:1 |
|  | Colonised bee hives |  | 5 | 1:5 |