

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**APIARY ATTENDANT**

**LEVEL 4**



TVET CDACC

P.O. BOX 15745-00100

NAIROBI

First published 2019

© 2019, TVET CDACC

All rights reserved. No part of these occupational standards may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods without the prior written permission of the TVET CDACC, except in the case of brief quotations embodied in critical reviews and certain other non-commercial uses permitted by copyright law. For permission requests, write to the Council Secretary/CEO, at the address below:

**Council Secretary/CEO**

**TVET Curriculum Development, Assessment and Certification Council**

**P.O. Box 15745–00100**

**Nairobi, Kenya**

**Email: info@tvetcdacc.go.ke**

# FOREWORD

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

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned in the Constitution and this resulted to the formulation of the Policy Framework for Reforming Education and Training. 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 mode of delivery allows 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 these occupational standards have been developed.

It is my conviction that these occupational standards will play a great role towards development of competent human resource for the Agriculture Sector’s growth and development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

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

The Technical and Vocational Education and Training Act No. 29 of 2013 and the sessional paper No 14 of 2012 on Reforming Education and Training in Kenya, 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 Kenyan labor force.

TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with Agriculture Sector Skills Advisory Committee (SSAC) have developed these occupational standards.

The occupational standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Apiculture SSAC, expert workers and all those who participated in the development of this occupational standards.

**CHAIRPERSON,**

**TVET CDACC**

# ACKNOWLEDGMENT

These occupational standards have been designed for competency-based training and has independent competencies of learning that allow the trainee flexibility in entry and exit. In developing the occupational standards, significant involvement and support was received from various organizations.

I recognize with appreciation the role of the Agriculture Sector Skills Advisory Committee (SSAC) in ensuring that competencies required by the industry are addressed in the standards. I also thank all stakeholders in the Apiculture sector for their valuable input and all those who participated in the process of developing these occupational standards.

I am convinced that these occupational standards will go a long way in ensuring that workers in Apiculture Sector acquire competencies that will enable them to perform their work more efficiently.

CHAIRMAN

AGRICULTURE SECTOR SKILLS ADVISORY COMMITTEE

Contents

[FOREWORD iii](#_Toc29807446)

[PREFACE iv](#_Toc29807447)

[ACKNOWLEDGMENT v](#_Toc29807448)

[ACRONYMS i](#_Toc29807449)

[KEY TO UNIT CODE 1](#_Toc29807450)

[OVERVIEW 2](#_Toc29807451)

[BASIC UNITS OF COMPETENCY 3](#_Toc29807452)

[DEMONSTRATE COMMUNICATION SKILLS 1](#_Toc29807453)

[DEMONSTRATE NUMERACY SKILLS 5](#_Toc29807454)

[DEMONSTRATE DIGITAL LITERACY 10](#_Toc29807455)

[DEMONSTRATE ENTREPRENEURIAL SKILLS 15](#_Toc29807456)

[DEMONSTRATE EMPLOYABILITY SKILLS 19](#_Toc29807457)

[DEMONSTRATE ENVIRONMENTAL LITERACY 28](#_Toc29807458)

[DEMONSTRATE OCUPATIONAL SAFETY AND HEALTH PRACTICES 33](#_Toc29807459)

[CORE UNITS OF COMPETENCY 37](#_Toc29807460)

[DEMONSTRATE BEE BIOLOGY AND BEHAVIOR 38](#_Toc29807461)

[ESTABLISH AN APIARY 43](#_Toc29807462)

[MANAGE BEE FORAGE RESOURCES 48](#_Toc29807463)

[MANAGE HONEY BEE SWARMS 54](#_Toc29807464)

[MANAGE HONEY BEE COLONY 58](#_Toc29807465)

[CONTROL HONEY BEE PESTS AND DISEASES 64](#_Toc29807466)

[HARVEST BEE PRODUCTS 68](#_Toc29807467)

#

# ACRONYMS AND ABBREVIATIONS

AGR Agriculture

API Apiculture

BC Basic Competency

CC Core Competency

CDACC Curriculum Development Assessment and Certification Council

CO Common Units

OSHA Occupation Safety and Health Act

PPE Personal Protective Equipment

SSAC Sector Skills Advisory Committee

TVET Technical and Vocational Education and Training

OS Occupational Standards

CR Core competency

# KEY TO UNIT CODE

 **AGR / CU/API/ BC/CO/ CC /01/ 4/A**

Industry or sector

Curriculum

Occupational area

Type of competency

Type of competency

Type of competency

Competency number

Competence level

Control Version

# OVERVIEW

The Apiculture management level 4 qualification consists of competencies that a person must achieve to demonstrate bee biology and behaviour, establish an apiary, manage bee forage resources, manage honey bee swarms, manage honey bee colony, control honey bee pests and diseases and harvest bee products within the institution’s/organizations acceptable standard operating procedures (SOPs).

**BASIC COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| AGR/OS/API/ BC/01/ 4/A | Demonstrate communication skills |
| AGR/OS/API/BC/02/ 4/A | Demostrate digital literacy skills |
| AGR/OS/API/ BC/03/ 4/A | Demonstrate Numeracy skills |
| AGR/OS/API/ BC/04/4 /A | Demonstrate entrepreneurial skills |
| AGR/OS/API/ BC/05/ 4/A | Demonstrate employability skills |
| AGR/OS/API/ BC/06/ 4/A | Demonstrate environmental literacy |
| AGR/OS/API/ BC/07/ 4/A | Demonstrate occupational safety and health practices |

**COMMON COMPETENCIES**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| AGR/OS/API/ CR/01/ 4/A | Demonstrate bee biology and behaviour  |
| AGR/OS/API/ CR/02/ 4/A | Establish an apiary |
| AGR/OS/API/ CR/03/ 4/A | Manage bee forage resources |
| AGR/OS/API/ CR/04/ 4/A | Manage honey bee swarms |
| AGR/OS/API/ CR/05/ 4/A | Manage honey bee colony |
| AGR/OS/API/ CR/06/ 4/A | Control honey bee pests and diseases |
| AGR/OS/API/ CR/07/ 4/A | Harvest bee products |

#

# BASIC UNITS OF COMPETENCY

**DEMONSTRATE COMMUNICATION SKILLS**

**UNIT CODE:** AGR/OS/API/BC/01/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required demonstrate communication skills. It involvesobtaining and conveying workplace information, completing relevant work-related documents, communicating information about workplace processes, leading workplace discussion and communicating workplace issues.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT** These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**These are assessable statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Obtain and convey workplace information
 | 1. Specific and relevant information is accessed from ***appropriate sources*** based on standard procedures
2. Effective questioning, active listening and speaking skills are used to gather and convey information based on communication needs
3. Appropriate ***medium*** is used to transfer information and ideas in accordance with workplace guidelines
4. Appropriate non- verbal communication is used as per the communication needs
5. Appropriate lines of communicationwith supervisors and colleagues are identified and followed based on workplace requirements
6. Location and storage of information is undertaken according to workplace procedures
	1. Personal interaction is carried out clearly and concisely according to workplace requirements
 |
| 1. Complete relevant work-related documents
 | * 1. Range of forms relating to conditions of employment are completed according to workplace procedures
	2. Workplace data is recorded based on workplace requirements
	3. Errors in recording information are identified and acted upon in accordance with workplace policies
	4. Reporting requirements are completed according to organizational guidelines
 |
| 1. Communicate information about workplace processes
 | 1. Information sources are identified according to workplace procedures
2. ***Methods of communication*** are selected based on workplace guidelines
3. Multiple operations are communicated according to workplace structure
4. Work-related questions are asked and responded based on set protocols
5. Information is selected and organized according to workplace requirements
6. Verbal and written reporting is undertaken as per workplace requirements
7. Communication is maintained according to workplace standards
 |
| 1. Lead workplace discussions
 | 1. Response to workplace issues is sought and provided as per workplace protocol
2. Constructive contributions are made based on ***workplace discussions***
3. Workplace objectives and action plan are communicated according to workplace requirements
 |
| 1. Identify and communicate issues arising in the workplace
 | 1. Issues and problems are identified as per workplace guidelines
2. Problems and issues in the workplace are organized according to workplace operations
3. Dialogue is initiated with appropriate personnel as per workplace structure
4. Problems and issues raised are communicated as per the workplace reporting procedures
 |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Methods of communication mayinclude but not limited to:
 | * Non-verbal gestures
* Verbal
* Face to face
* Two-way radio
* Speaking to groups
* Using telephone
* Written
* Internet
 |
| 1. Workplace discussion may include but not limited to:
 | * Coordination meetings
* Toolbox discussion
* Peer-to-peer discussion
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Active listening
* Interpretation
* Negotiation
* Writing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Organization requirements for written and electronic communication methods
* Effective verbal communication methods
* Report writing
* Effective questioning techniques (clarifying and probing)
* Workplace etiquette

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency
 | Assessment requires evidence that the candidate: 1. Dealt with a range of communication/information at one time
2. Made constructive contributions in workplace issues
3. Sought workplace issues effectively
4. Responded to workplace issues promptly
5. Presented information clearly and effectively in written form
6. Used appropriate sources of information
7. Asked appropriate questions
8. Provided accurate information
 |
| 1. Resource Implications
 | 1. Access to relevant workplace where assessment can take place
2. Appropriately simulated environment where assessment can take place
3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | 1. Third-party reports
2. Portfolio
3. Interview
4. Written tests
5. Observation
6. Oral questioning
 |
| 1. Context of Assessment
 | Competency may be assessed 1. On the job
2. Off the job
3. During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**DEMONSTRATE NUMERACY SKILLS**

**UNIT CODE:** AGR/OS/API/BC/02/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate numeracy skills. It involves identifying and using whole numbers and simple fractions, decimals and percentages for work, identifying, measuring and estimating familiar quantities for work, reading and using familiar maps, plans and diagrams for work, identifying and describing common 2D and some 3D shapes for work, constructing simple tables and graphs for work using familiar data and identifying and interpreting information in familiar tables, graphs and charts for work.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT** These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**These are assessable statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range.*** |
| 1. Identify and use whole numbers and simple fractions, decimals and percentages for work
 | 1. Simple fractions, decimals and percentages identified and interpreted as per standard operating procedures.
2. Understanding of place value by organising numbers from smallest to largest demonstrated as SOPs
3. Required numerical information located and decision made on appropriate method to solve a problem as per SOPs
4. Limited range of calculations performed using the four operations using SOPs
5. Links between operations described as per SOPs
6. Estimations made to check reasonableness of results of problem-solving process as SOPs
7. Numerical information recorded, and the result of the task communicated using informal and some formal language and symbolism as per workplace procedures
 |
| 1. Identify, measure and estimate familiar quantities for work
 | 1. Measurement information in workplace tasks and texts identified and interpreted as per workplace procedures.
2. Familiar units of measurement needed for tasks is identified as per measurements manuals/charts
3. Familiar and simple amounts estimated as per workplace procedures.
4. Appropriate measuring equipment selected as per SOPs
5. ***Simple measuring equipment*** graduated in familiar units to measure relevant quantities is used as per graduation manuals.
6. Calculation done using familiar units of measurement as per SOPs
7. Measurements and results checked against estimates as per job specifications.
8. Results are recorded or reported as per workplace procedures
9. Results relevant to the workplace task are communicated using informal and some formal mathematical and general language as per workplace procedures.
 |
| 1. Read and use familiar maps, plans and diagrams for work
 | 1. Items and places are in familiar maps, plans and diagrams as per SOPs
2. Common symbols and keys recognised in familiar maps, plans and diagrams as per SOPs
3. Understanding of direction and location demonstrated by describing the location of objects, or route to familiar places as per SOPs
4. Instructions to locate familiar objects or places are given and followed as per SOPs
5. Informal and some formal oral mathematical language and symbols are used as per SOPs
 |
| 1. Identify and describe common 2D and some 3D shapes for work
 | 1. ***Common 2D shapes and some common 3D shapes*** in familiar situations are identified and named as per job requirements
2. Common 2D shapes and designs are compared and classified as per SOPs
3. Informal and some formal language used to describe common two-dimensional shapes and some common three-dimensional shapes in accordance with workplace procedures.
4. Simple items used to draw or construct common 2D shapes as per workplace procedures.
5. Common 3D shapes matched to their 2D sketches or nets as per SOPs
 |
| 1. Construct simple tables and graphs for work using familiar data
 | 1. Common types of graphs are identified and named as per SOPs
2. Familiar data to be collected is determined in accordance with job specifications.
3. A method to collect data is selected in accordance with workplace procedures.
4. A small amount of simple familiar data is collected as per workplace procedures
5. One or two variables determined from the data collected as per SOPs.
6. Data ordered and collated as per standard operating procedures.
7. A table is constructed and data entered as per SOPs
8. Graphs are constructed using data from table as per job specifications
9. Results are promptly checked as per workplace procedures
10. Graph information related to work is reported or discussed using informal and some formal mathematical and general language as per workplace procedures
 |
| 1. Identify and interpret information in familiar tables, graphs and charts for work
 | 1. Simple tables are identified in familiar texts and contexts in accordance with workplace procedures
2. Title, headings, rows and columns located in familiar tables as per SOPs
3. Information and data in simple tables identified and interpreted as per workplace procedures.
4. Information is related in accordance with workplace tasks
5. Familiar graphs and charts are identified in familiar texts and contexts as per SOPs
6. Title, labels, axes, scale and key from familiar graphs and charts are located as per SOPs
7. Information and data in familiar graphs and charts are identified and interpreted as per job requirements
8. Information is related to relevant workplace tasks as per job requirements.
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Simple measuring equipment may include but not limited to:
 | * Rulers
* Watches/clocks
* Scales
* Thermometers
* AVO meter
 |
| 1. Common 2D shapes and common 3D shapes may include but not limited to:
 | * Round
* Square
* Rectangular
* Triangle
* Sphere
* Cylinder
* Cube
* Polygons
* Cuboids
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Measuring
* Logical thinking
* Computing
* Drawing of graphs
* Applying mathematical formulas
* Analytical

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Types of common shapes
* Differentiation between two dimensional shapes / objects
* Formulae for calculating area and volume
* Types and purpose of measuring instruments
* Units of measurement and abbreviations
* Fundamental operations (addition, subtraction, division, multiplication)
* Rounding techniques
* Types of fractions
* Different types of tables and graphs
* Meaning of graphs, such as increasing, decreasing, and constant value
* Preparation of basic data, tables & graphs

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency
 | Assessment requires evidence that the candidate:* 1. Simple fractions, decimals and percentages are correctly identified and interpreted
	2. Performed a limited range of calculations using the 4 operations
	3. Performed calculations using familiar units of measurement
	4. Recognised common symbols and keys in familiar maps, plans and diagrams
	5. Constructed simple tables and graphs using familiar data
	6. Identified and interpret information in familiar tables, graphs and charts
 |
| 1. Resource Implications
 | 1. Access to relevant workplace where assessment can take place
2. Appropriately simulated environment where assessment can take place
3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:1. Written Test
2. Interview
3. Oral Questioning
 |
| 1. Context of Assessment
 | Competency may be assessed 1. On the job
2. Off the job
3. During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**DEMONSTRATE DIGITAL LITERACY**

**UNIT CODE:** AGR/OS/API/BC/03/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate digital literacy in a working environment. It entails identifying computer software and hardware, applying security measures to data, hardware, software , applying computer software in solving task sand applying internet and email in communication at workplace.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT** These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**These are assessable statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Identify computer software and hardware
 | * 1. ***Appropriate computer software*** is identified according to manufacturer’s specification
	2. ***Appropriate computer hardware*** is identified according to manufacturer’s specification
 |
| 1. Apply security measures to data, hardware, software
 | * 1. ***Data security and privacy are classified*** in accordance with the technological situation
	2. ***Security and control measures*** are applied in accordance with laws governing protection of ICT
	3. Computer threats and crimes are detected as per information security management guidelines.
	4. Protection against computer crimes is undertaken in accordance with laws governing protection of ICT
 |
| 1. Apply computer software in solving tasks
 | * 1. Basic word processing concepts are applied in resolving workplace tasks
	2. Word processing utilities are applied in accordance with workplace procedures
	3. Data is manipulated on worksheet in accordance with office procedures
 |
| 1. Apply internet and email in communication at workplace
 | * 1. Electronic mail is applied in workplace communication in accordance with office procedures
	2. Office internet functions are defined and executed in accordance with office procedures
	3. Network configuration and uses are determined in accordance with office operations procedures
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Range** | **Variable** |
| 1. Appropriate computer software may include but not limited to:
 | * Operating system
* MS office
* Web browser
* Media players
 |
| 1. Appropriate computer hardware may include but not limited to:
 | * Computer Case
* Monitor
* Keyboard
* Mouse
* Hard Disk Drive
* Motherboard
* Video Card
 |
| 1. Data security and privacy may include but not limited to:
 | * Confidentiality
* Cloud computing
* Confidentiality
* Cyber terrorism
* Integrity -but-curious data serving
 |
| 1. Security and control measures may include but not limited to:
 | * Countermeasures and risk reduction
* Cyber threat issues
* Risk management
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical
* Interpretation
* Typing
* Communication
* Computing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Input and output devices
* Central processing Unit (CPU)
* Peripherals
* Storage Media
* Software concept
* Types of concept
* Function of computer software
* Data security and privacy
* Security threats and control measures
* Computer crimes
* Detection and protection of computer crimes
* Laws governing protection of ICT
* Word processing;
* Functions and concepts of word processing.
* Documents and tables creation and manipulations
* Mail merging
* Word processing utilities
* Spread sheet;
* Meaning, formulae, function and charts, uses, layout, data manipulation and application to cell
* Networking and Internet;
* Meaning, functions and uses of networking and internet.
* Electronic mail and world wide web
* Emerging trends and issues in ICT;
* Identify and apply emerging trends and issues in ICT
* Challenges posed by emerging trends and issues

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:* 1. Identified input, output, CPU and storage media devices of computers in accordance to computer specification
	2. Identified concepts, types and functions of computer software according to operation manual
	3. Identified and controlled security threats
	4. Detected and protected computer crimes
	5. Applied word processing in office tasks
	6. Prepared work sheet and applied data to the cells in accordance to workplace procedures
	7. Used Electronic Mail for office communication as per workplace procedure
	8. Applied internet and World Wide Web for office tasks in accordance with office procedures
	9. Applied laws governing protection of ICT
 |
| 1. Resource Implications
 | * 1. Access to relevant workplace where assessment can take place
	2. Appropriately simulated environment where assessment can take place
	3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Practical assignment
	3. Interview
	4. Oral Questioning
	5. Observation
 |
| 1. Context of Assessment
 | Competency may be assessed 1. On the job
2. Off the job
3. During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**DEMONSTRATE ENTREPRENEURIAL SKILLS**

**UNIT CODE:** AGR/OS/API/BC/04/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required demonstrate entrepreneurial skills. It involvescreating and maintaining small scale business, establishing small scale business customer base, managing small scale business and growing/ expanding small scale business.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the **key outcomes** which make up workplace function. | **PERFORMANCE CRITERIA**These are assessable statements which specify the required level of performance for each of the elements.***Bold and italicized terms are elaborated in the Range*** |
| 1. Create and maintain small scale business
 | 1. Generation and evaluation of business ideas is undertaken in accordance with the existing procedure
2. Competencies are matched with business opportunities in accordance with business practices.
3. Procedure for starting a small business is identified as per the legal requirements
4. SWOT/ PESTEL analysis and or industrial survey is carried out according to office procedures
5. ***Business operations*** are monitored and controlled following established procedures.
6. Quality assurance measures are implemented in accordance with the business practices.
7. Good relations are maintained with staff/workers as per the workplace policies.
8. Policies and procedures on occupational safety and health and environmental concerns are constantly observed as per the workplace policies
 |
| 1. Establish small scale business customer base
 | 1. Good customer relations are maintained in accordance with office procedures
2. New customers and markets are identified, explored and reached out to according to the marketing plan
3. Promotions/Incentives are offered to loyal customers in accordance with office procedures
4. Additional products and services are evaluated and tried in accordance with marketing strategy
5. Customer record is maintained in accordance with office procedures
 |
| 1. Manage small scale business
 | 1. Enterprise is built up and sustained in line with judicious control of cash flows.
2. Profitability of enterprise is ensured as per the internal controls.
3. Unnecessary or lower-priority expenses and purchases are avoided as per the marketing strategy
4. Basic cost-benefit analysis are undertaken in accordance with office procedures
5. Basic financial management are undertaken in accordance with office procedures
6. Basic financial accounting in undertaken in accordance with office procedures
7. Business ***internal controls*** are implemented in accordance with office procedure
8. Setting business priorities and strategies is carried out according to office procedures
9. Preparation and interpretation of basic financial statements is undertaken in accordance with set procedures
10. Preparation of business plansfor small business is undertaken in accordance with ***business strategy***
11. Business Social Responsibility is maintained in accordance with Standard Operations Procedures (SOP)
 |
| 1. Grow/ expand small scale business
 | 1. Prepared business growth strategy for small sale business in accordance with office procedures
2. Incorporated technology in small scale business growth in accordance with technological trends
3. Emerging issues and trends are considered in accordance with business growth strategy
4. Built audience interest in product/service according to growth strategy
5. Boosted cooperate communication according to business ***communication strategy***
 |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range**  |
| 1. Business operations may include but not limited to:
 | * Purchasing
* Accounting/administrative
* Work production/operations/sales
* Marketing
 |
| 1. Internal control may include but not limited to:
 | * Accounting systems
* Financial statements/reports
* Cash management
* Human resource management
 |
| 1. Business Strategy may include but not limited to:
 | * Management of wastages
* Environmental Conservation
 |
| 1. Communication strategy may include but not limited to:
 | * Blue print of exchange of information
* Technology and exchange of information
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Marketing
* Advertising
* Basic bookkeeping
* Accounting
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Generation and evaluation of business ideas
* Legal requirements for starting a small business
* SWOT/ PESTEL analysis
* Occupational Safety and Health
* Public relations concepts
* Business plan
* Business financing
* Marketing strategies
* Business management and control
* Production/ operation process
* Product promotion strategies
* Market and feasibility studies
* Business ethics
* Building customer relations
* Business models and strategies
* Types and categories of businesses
* Business internal controls
* Relevant national and local legislation and regulations
* Basic quality control and assurance concepts
* Building relations with customer and employees
* Building competitive advantage of the enterprise
* Business growth strategies

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |  |
| --- | --- | --- |
| 1. Critical aspects of Competency
 | Assessment requires evidence that the candidate:

|  |
| --- |
| 1. Demonstrated entrepreneurial skills
2. Demonstrate competencies to create a small-scale business
3. Demonstrated ability to conceptualize and plan a micro/small business
4. Grew customer base for the small-scale business
5. Demonstrated ability to manage/operate a micro/small-scale business
6. Demonstrated competencies to grow a micro/small-scale business
 |

 |
| 1. Resource Implications
 |

|  |
| --- |
| The following resources should be provided:  |

1. Assessment location
2. Case studies on micro/small-scale enterprises
3. Assessment materials
 |
| 1. Methods of Assessment
 | Competency in this unit may be assessed through:

|  |  |
| --- | --- |
| 1. Written tests
2. Observation
3. Oral questioning
4. Portfolio
5. Projects
 |  |

 |
| 1. Context of Assessment
 | Competency may be assessed 1. On the job
2. Off the job
3. During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**DEMONSTRATE EMPLOYABILITY SKILLS**

**UNIT CODE:** AGR/OS/API/BC/05/4/A

**UNIT DESCRIPTON**

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating critical safe work habits, demonstrating workplace learning and workplace ethics.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**These are assessable statements which specify the required level of performance for each of the elements.***Bold and italicized terms are elaborated in the Range*** |
| 1. Conduct self-management
 | 1. Personal vision, mission and goals are formulated based on potential and in relation to organization objectives
2. Emotional intelligence is demonstrated as per workplace requirements.
3. Individual performance is evaluated and monitored according to the agreed targets.
4. Assertiveness is developed and maintained based on the requirements of the job.
5. Accountability and responsibility for own actions are demonstrated based on workplace instructions.
6. Self-esteem and a positive self-image are developed and maintained based on values.
7. Time management, attendance and punctuality are observed as per the organization policy.
8. Goals are managed as per the organization’s objective
9. Self-strengths and weaknesses are identified based on personal objectives
 |
| 1. Demonstrate critical safe work habits
 | 1. Stress is managed in accordance with workplace policy.
2. Punctuality and time consciousness is demonstrated in line with workplace policy.
3. Personal objectives are integrated with organization goals based on organization’s strategic plan.
4. ***Resources*** are utilized in accordance with workplace policy.
5. Work priorities are set in accordance to workplace goals and objectives.
6. Leisure time is recognized and utilized in line with personal objectives.
7. ***Drugs and substances of abuse*** are identified and avoided based on workplace policy.
8. HIV and AIDS prevention awareness is demonstrated in line with workplace policy.
9. Safety consciousness is demonstrated in the workplace based on organization safety policy.
10. ***Emerging issues*** are identified and dealt with in accordance with organization policy.
 |
| 1. Demonstrate workplace learning
 | * 1. Learning opportunities are sought and managed based on job requirement and organization policy.
	2. Improvement in performance is demonstrated based on courses attended.
	3. Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job
	4. Time and effort is invested in learning new skills based on job requirements
	5. Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy.
	6. New systems are developed and maintained in accordance with the requirements of the job.
	7. Awareness of personal role in workplace ***innovation*** is demonstrated based on requirements of the job.
 |
| 1. Demonstrate workplace ethics
 | 1. Policies and guidelines are observed as per the workplace requirements
2. Self-worth and professionalism is exercised in line with personal goals and organizational policies
3. Code of conduct is observed as per the workplace requirements
4. Integrity is demonstrated as per legal requirement
 |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Range** | **Variable** |
| 1. Personal objectives may include but not limited to:
 | 1. Long term
2. Short term
3. Broad
4. Specific
 |
| 1. Feedback may include but not limited to:
 | 1. Verbal
2. Written
3. Informal
4. Formal
 |
| 1. Team may include but not limited to:
 | 1. Small work group
2. Staff in a section/department
3. Inter-agency group
 |
| 1. Drug and substance abuse may include but not limited to:
 | 1. Alcohol
2. Tobacco
3. Miraa
4. Over-the-counter drugs
5. Cocaine
6. Bhang
7. Glue
 |
| 1. Emerging issues may include but not limited to:
 | 1. Terrorism
2. Social media
3. National cohesion
4. Open offices
 |
| 1. Range of media for learning may include but not limited to:
 | 1. Mentoring
2. peer support and networking
3. IT and courses
 |
| 1. Innovation may include but not limited to:
 | 1. New ideas
2. Original ideas
3. Different ideas
4. Methods/procedures
5. Processes
6. New tools
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

1. Communication
2. Interpersonal
3. Critical thinking
4. Observation
5. Organizing
6. Record keeping
7. Problem solving
8. Decision Making
9. Resource utilization

**Required Knowledge**

The individual needs to demonstrate knowledge of:

1. Work values and ethics
2. Company policies
3. Company operations, procedures and standards
4. Occupational Health and safety procedures
5. Fundamental rights at work
6. Personal hygiene practices
7. Workplace communication
8. Concept of time
9. Time management
10. Decision making
11. Types of resources
12. Work planning
13. Record keeping
14. Workplace problems and how to deal with them
15. Assertiveness
16. Team work
17. HIV and AIDS
18. Drug and substance abuse
19. Safe work habits
20. Professional growth and development
21. Technology in the workplace
22. Emerging issues
	* Social media
	* Terrorism
	* National cohesion

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency
 | Assessment requires evidence that the candidate:* 1. Conducted self-management
	2. Demonstrated critical safe work habits
	3. Demonstrated workplace learning
	4. Demonstrated workplace ethics
 |
| 1. Resource Implications
 | The following resources should be provided:1. Access to relevant workplace where assessment can take place
2. Appropriately simulated environment where assessment can take place
 |
| 1. Methods of Assessment
 | Competency in this unit may be assessed through: 1. Oral questioning
2. Portfolio of evidence
3. Third Party Reports
4. Written tests
 |
| 1. Context of Assessment
 | Competency may be assessed: 1. On-the-job
2. Off-the –job
3. During Industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**DEMONSTRATE ENVIRONMENTAL LITERACY**

**UNIT CODE:** AGR/OS/API/BC/06/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to demonstrate environmental literacy. It involves controlling environmental hazard, controlling environmental pollution, demonstrating sustainable resource use and evaluating current practices in relation to resource usage.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**These are assessable statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Control environmental hazard
 | * 1. Storage methods for environmentally hazardous materials are followed according to environmental regulations and OSHS.
	2. Disposal methods of hazardous wastes are followed according to environmental regulations and OSHS.
	3. ***PPE*** is used according to OSHS.
 |
| 1. Control environmental pollution
 | * 1. ***Environmental pollution*** ***control measures*** are compiled following standard protocol.
	2. Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999
	3. Methods for minimizing noise pollution complied following environmental regulations.
 |
| 1. Demonstrate sustainable use of resource s
 | * 1. Methods for minimizing wastage are complied with.
	2. ***Waste management procedures*** are employed following principles of 3Rs (Reduce, Reuse, Recycle)
	3. Methods for economizing or reducing resource consumption are practiced.
 |
| 1. Evaluate current practices in relation to resource usage
 | * 1. Information on resource efficiency ***systems and procedures*** are collected and provided as per work groups/sector
	2. ***Current resource usage*** is measured and recorded as per work group/sector
	3. Current purchasing strategies are analyzed and recorded according to industry procedures.
	4. Current work processes to access information and data is analyzed following enterprise protocol.
 |
| 1. Identify environmental legislations/conventions for environmental concerns
 | 1. Environmental legislations/conventions and local ordinances are identified according to the different environmental aspects/impact
2. Industrial standard/environmental practices are described according to the different environmental concerns
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. PPE may include but are not limited to:
 | * Masks
* Gloves
* Goggles
* Safety hat
* Overall
* Hearing protector
* Safety boots
 |
| 1. Environmental pollution control measures may include but are not limited to:
 | * Methods for minimizing or stopping spread and ingestion of airborne particles
* Methods for minimizing or stopping spread and inhaling gases and fumes
* Methods for minimizing or stopping spread and ingestion of liquid wastes
 |
| 1. Waste management procedures may include but are not limited to:
 | * Sorting
* Storing of items
* Recycling of items
* Disposal of items
* Handling
* Transport
 |
| 1. Current resources usage may include but are not limited to:
 | * Electric
* Water
* Fuel
* Telecommunications
* Supplies
* Materials
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Measuring
* Recording
* Analytical
* Monitoring
* Writing
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Storage methods of environmentally hazardous materials
* Disposal methods of hazardous wastes
* Usage of PPE Environmental regulations
* OSHS
* Types of pollution
* Environmental pollution control measures
* Different solid wastes
* Solid waste management
* Different noise pollution
* Methods of minimizing noise pollution
* Solid Waste Act
* Methods of minimizing wastage
* Waste management procedures
* Economizing of resource consumption
* Principle of 3Rs
* Types of resources
* Techniques in measuring current usage of resources
* Calculating current usage of resources
* Types of workplace environmental hazards
* Environmental regulations
* Environmental regulations applying to the enterprise.
* Procedures for assessing compliance with environmental regulations.
* Collection of information on environmental and resource efficiency systems and procedures,
* Measurement and recording of current resource usage
* Analysis and recording of current purchasing strategies.
* Analysis current work processes to access information and data Analysis of data and information

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:1. Controlled environmental hazards
2. Controlled environmental pollution
3. Demonstrated sustainable resource use
4. Evaluated current practices in relation to resource usage
 |
| 1. Resource Implications
 | The following resources should be provided:* 1. Workplace with storage facilities
	2. Tools, materials and equipment relevant to the tasks (e.g. cleaning tools, cleaning materials, trash bags, etc.)
	3. PPEs
	4. Manuals and references
	5. Legislation, policies, procedures, protocols and local ordinances relating to environmental protection
	6. Case studies/scenarios relating to environmental Protection
 |
| 1. Methods of Assessment
 | Competency in this unit may be assessed through:1. Observation
2. Oral questioning
3. Written tests
4. Third party reports
5. Portfolio
 |
| 1. Context of Assessment
 | Competency may be assessed:1. On the job
2. Off the job
3. During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**DEMONSTRATE OCUPATIONAL SAFETY AND HEALTH PRACTICES**

**UNIT CODE:** AGR/OS/API/BC/07/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to practice safety and health and comply with OSH requirements relevant to work. It involves observing workplace procedures for hazards and risk prevention and participating in arrangements for workplace safety and health maintenance.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**These are assessable statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Adhere to workplace procedures for hazards and risk prevention
 | 1. Arrangement of work area and items in accordance with workplace procedures requirements
2. Work standards and procedures are followed based on instructions
3. ***Prevention and control measures*** are applied based on instructions
 |
| 1. Participate in arrangements for workplace safety and health maintenance
 | 1. Orientations on ***OSH requirements and regulations*** is undertaken in line with policy.
2. Feedback on occupational health and safety are provided as per workplace instructions.
3. Workplace procedures for reporting hazards, incidents, injuries and sickness are adhered to as per workplace policy.
4. ***OSH-related training needs*** are identified and proposed as per workplace policy.
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Prevention and control measures may include but are not limited to:
 | * Eliminate the hazard
* Isolate the hazard
* Substitute the hazard with a safer alternative
* Use administrative controls to reduce the risk
* Use engineering controls to reduce the risk
* Use personal protective equipment
* Safety, Health and Work Environment Evaluation
* Periodic and/or special medical examinations of workers
 |
| 1. Safety gears /PPE (Personal Protective Equipment’s) may include but are not limited to:
 | * Arm/Hand guard, gloves
* Eye protection (goggles, shield)
* Hearing protection (ear muffs, ear plugs)
* Hair Net/cap/bonnet
* Hard hat
* Face protection (mask, shield)
* Apron/Gown/coverall/jump suit
* Anti-static suits
* High-visibility reflective vest
 |
| 1. Incidents and emergencies may include but are not limited to:
 | * Chemical spills
* Equipment/vehicle accidents
* Explosion
* Fire
* Gas leak
* Injury to personnel
* Structural collapse
* Toxic and/or flammable vapors emission.
 |
| 1. OSH requirements / regulations may include but are not limited to:
 | * Building code
* Permit to Operate
 |
| 1. OSH-related trainings may include but are not limited to:
 | * Safety Orientations relevant to tasks
* Safe and Correct Operation of Tools and Equipment
* Health Orientations/trainings
* Prevention and Control of OSH Hazards in the workplace
* Chemical Handling
* Safety Trainings
* Prevention and Control of Work-related Injuries and Illness
* Basic First-aid Trainings
* Emergency Response Trainings
* Trainings on use of fire-extinguisher
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Knowledge management
* Collaborating
* Interpersonal
* Troubleshooting
* Critical thinking
* Observation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* General OSH principles and legislations
* Principles of good housekeeping (5S)
* Company/workplace policies/ guidelines
* Standards and safety requirements of work process and procedures
* Standard Workplace emergency plan and procedures
* Safety and health requirements of tasks
* Workplace guidelines on providing feedback on OSH and security concerns
* OSH regulations
* Hazard control procedures
* OSH trainings relevant to work

**EVIDENCE GUIDE**

|  |  |
| --- | --- |
| 1. This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:1. Arranged work area and items in accordance with
2. workplace procedures requirements
3. Followed work standards and procedures based on instructions
4. Applied ***Prevention and control measures*** based on instructions
5. Undertook orientations on ***OSH requirements and regulations*** in line with policy.
6. Provided feedback on occupational health and safety as per workplace instructions.
7. Adhered to workplace procedures for reporting hazards, incidents, injuries and sickness to as per workplace policy.
8. Identified and proposed ***OSH-related training needs*** as per workplace policy.
 |
| 1. Resource Implications
 | The following resources should be provided:1. Access to relevant workplace where assessment can take place
2. Appropriately simulated environment where assessment can take place
 |
| 1. Methods of Assessment
 | Competency in this unit may be assessed through: 1. Oral questioning
2. Portfolio of evidence
3. Third Party Reports
4. Written tests
 |
| 1. Context of Assessment
 | Competency may be assessed: 1. On-the-job
2. Off-the –job
3. During Industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# CORE UNITS OF COMPETENCY

# DEMONSTRATE BEE BIOLOGY AND BEHAVIOR

**UNIT CODE:** AGR/OS/API/CR/01/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to demonstrate bee biology and behavior. It involves identifying bee races, demonstrating understanding of bee lifecycle and caste, demonstrating understanding of the physiological system of bees, determining bee nutrition and demonstrating the understanding of bee behavior.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the **key outcomes** which make up **workplace function**. | **PERFORMANCE CRITERIA**These are **assessable** statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Identify bee races
 | 1. ***Materials and equipment for identification*** are identified as per the workplace procedures.
2. Personal protective equipment is worn as per the occupational health and safety procedures.
3. ***Bee parts/external morphology*** are identified as per the workplace procedures.
4. Bee races are identified as per the workplace procedures.
 |
| 1. Demonstrate understanding of bee lifecycle and caste
 | 1. Knowledge on ***Life cycle and caste*** demonstrated adequately
 |
| 1. Demonstrate understanding of the physiological system of bees
 | 1. Knowledge of ***physiological systems*** in bees is demonstrated adequately
 |
| 1. Determine bee nutrition
 | 1. Knowledge of bee nutrition is demonstrated workplace procedures
2. ***Bee feed supplements/substitutes*** are formulated, packaged and stored as per the workplace procedures
 |
| 1. Demonstrate the understanding of bee behavior
 | 1. ***Types of bee behavior*** are identified appropriately
2. Knowledge of ***factors affecting bee behavior*** is demonstrated adequately
3. Bee behavior is ***controlled*** based on the identified behavior
4. Methods of controlling bee behavior are applied
5. Understanding of bee behavior demonstrated
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variables | Range |
| 1. Materials and equipment for identification May Includes but not limited to:
 | * Hand lens
* Observation hive
 |
| 1. Bee parts/external morphology May Includes but not limited to:
 | * Wings
* Legs
* Antenna
* Eyes
* Thorax
* Abdomen
* Body hair
* Color
* Head
 |
| 1. Life cycle May Includes but not limited to:
 | * Egg
* Larvae
* Pupa
* Adult
 |
| 1. Caste May Includes but not limited to:
 | * Queen bees
* Drawn bees
* Worker bees
 |
| 1. Physiological systems May Includes but not limited to:
 | * Reproductive,
* Respiratory excretion
* Digestive
* Internal and external glandular systems
 |
| 1. Bee feed supplements/substitutes May Includes but not limited to:
 | * Honey
* Sugar syrup
* Corn syrup
* Soya beans
* Pollen supplements and substitutes
* Carbohydrate supplements
 |
| 1. Types of bee behavior May Includes but not limited to:
 | * Swarming
* Absconding
* Migration
* Scouting
* Supercedure
* Defensiveness
* Communication
* Fanning
* Buzzing
 |
| 1. Factors affecting bee behavior May Includes but not limited to:
 | * Physiological age and stage of development
* Hormonal factors
* Genetic make-up
* Sounds
* Chemical
* Touch
* Forage resources and nest sites
* Environmental
 |
| 1. Controlled May Includes but not limited to:
 | * Pest management
* Colony division
* Natural selection
* Destroying swarm cells
* Caging the queen
* Clipping the wings
* Identification and propagation of plants which flower throughout the year
* Artificial feeding
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Organizing skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Types of bees
* Types of PPE
* Lifecycle
* Caste system
* Physiological systems of bees
* Types of bee supplements and substitutes
* Formulation and packaging techniques
* Types of bee behavior
* Factors affecting bee behavior
* Methods of controlling bee behavior
* Bee behavior

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:* 1. Identified materials and equipment for species identification as per the workplace procedures
	2. Identified bee parts/external morphology as per the workplace procedures.
	3. Identified bee species and races as per the workplace procedures.
	4. Demonstrated knowledge on Life cycle and caste adequately
	5. Demonstrated knowledge of physiological systems in bees adequately
	6. Demonstrated knowledge of bee nutrition adequately
	7. Formulated, packaged and stored bee feed supplements/substitutes appropriately
	8. Identified types of bee behavior appropriately
	9. Demonstrated knowledge of factors affecting bee behavior adequately
	10. Controlled bee behavior.
	11. Applied methods of controlling bee behavior.
 |
| 1. Resource Implications for competence certification
 | The following resources must be provided:* 1. Access to relevant workplace where assessment can take place
	2. Appropriately simulated environment where assessment can take place
	3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Third party reports
	3. Oral questioning
	4. Interview
	5. Observation
 |
| 1. Context of Assessment
 | Assessment could be conducted:* On-the-job
* Off-the–job
* During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with related units in the sector |

# ESTABLISH AN APIARY

**UNIT CODE:** AGR/OS/API/CR/02/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to establish an apiary. It involves selecting apiary site, clearing the apiary site, fencing apiary site, preparing bee hives, installing bee hive, constructing bee house and Managing apiary facilities

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**These are **assessable** statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Select apiary site
 | 1. ***Key factors*** for selection of an apiary site are considered based on workplace procedures.
2. The apiary site is identified as per work place procedures
 |
| 1. Clear apiary site
 | 1. ***Materials, tools and equipment for clearing*** the apiary site are assembled as per workplace procedures.
2. The ***apiary site is cleared*** as per the workplace procedures and selected site.
3. The ground is levelled as per the site selected
 |
| 1. Fence apiary site
 | 1. ***Materials, tools and equipment for fencing*** the apiary site are assembled as per workplace procedures.
2. The apiary site is demarcated as per as per the size of the selected apiary.
3. Poles are fixed as per the workplace procedures
4. Barbed wire is fixed or live fence is planted as per the workplace procedures.
5. A lockable door/gate is fixed as per the workplace procedures.
 |
| 1. Prepare bee hives
 | 1. Bee hives are assembled as per workplace procedures
2. The bee hives are ***cleaned*** as per the workplace procedures
3. The hives are labelled as per the workplace procedures.
4. The hives are baited as per the available material.
 |
| 1. Install bee hives
 | 1. Hive stands/platforms are fixed as per the workplace procedures
2. Hives are hanged on stands/platforms or suspended between posts and trees based on the bee keeping manual.
 |
| 1. Construct bee house
 | * 1. ***Materials, tools and equipment for constructing the bee house*** are assembled as per workplace procedures, design and size of the bee house.
	2. The bee house site is selected and prepared as per workplace procedures.
	3. Size of the bee house determined as per the number of hives
	4. The bee house constructed as per the workplace procedure or bee keeping manual
	5. Post construction activities are carried out as per the workplace procedures.
 |
| 1. Manage apiary facilities
 | * 1. Bee forage and water resources are established based on the ecological zones
	2. Unwanted vegetation is cleared as per workplace procedures
	3. Pest control measures are applied as per the workplace procedure
	4. Repair and maintenance of apiary facilitiesis conducted as per the workplace procedures
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variables | Range |
| 1. Key factors May Includes but not limited to:
 | * Forage and water resources
* Accessibility
* Proximity to public amenities
* Natural hazards
* Drainage
* Terrain
* Shade/shelter
 |
| 1. Materials, tools and equipment for clearing May Includes but not limited to:
 | * Spades
* tape measure
* slashers
* hoes
* rake
* PPE
 |
| 1. Apiary site is cleared May Includes but not limited to:
 | * Stones
* Excess vegetation
* Tree stumps
* Post hole digger
 |
| 1. Materials, tools and equipment for fencing May Includes but not limited to:
 | * Barbed wire
* Chain link
* Poles
* Seedlings and cuttings for live/hedge
* Nails
* Hammer
* Mattock
 |
| 1. Cleaned May Includes but not limited to:
 | * Brushing
* Burning grass inside
 |
| 1. Materials, tools and equipment for constructing the bee house May Includes but not limited to:
 | * Poles
* Rafters,
* Roofing material
* Wire mesh
* Nails
* Timber
* Mud
* Blocks
* Bricks
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Organizing skills
* Analytical skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking
* Appropriate use of tools and equipment.
* Numeracy
* Digital literacy

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Types of hives
* Importance of baiting
* Materials used for baiting
* Factors considered while establishing an apiary
* Hive placement methods

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:1. Observed key factors for an apiary site correctly
2. identified the apiary site as per work place procedures
3. Prepared materials, tools and equipment for clearing, fencing, constructing the apiary site as per workplace procedures.
4. Cleared the apiary site as per the workplace procedures and selected site.
5. Demarcated the apiary site as per as per the size of the selected apiary.
6. Fixed poles, barbed, lockable door/gate wire as per the workplace procedures
7. Assembled bee hives as per workplace procedures
8. Cleaned the bee hives as per the workplace procedures
9. Labelled and baited the hives as per the workplace procedures.
10. Fixed hive stands/platforms as per the workplace procedures
11. Hanged/suspended/place hives on stands/platforms or between posts and trees based on the bee keeping manual.
12. Selected and prepared the bee house site as per workplace procedures.
13. Determined size of the bee house as per the number of hives
14. Constructed the bee house as per the workplace procedure or bee keeping manual
15. Carried out post construction activities as per the workplace procedures.
 |
| 1. Resource Implications for competence certification
 | The following resources must be provided:* 1. Access to relevant workplace where assessment can take place
	2. Appropriately simulated environment where assessment can take place
	3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Third party reports
	3. Oral questioning
	4. Interview
	5. Observation
 |
| 1. Context of Assessment
 | Assessment could be conducted:* On-the-job
* During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with related units in the sector |

# MANAGE BEE FORAGE RESOURCES

**UNIT CODE:** AGR/OS/API/CR/03/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required manage bee forage resources. It involves identifying suitable bee forage, establishing forage resources, conserving forage resources, developing a beekeeping flowering calendar and Providing water for bees

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the **key outcomes** which make up **workplace function**. | **PERFORMANCE CRITERIA**These are **assessable** statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Identify suitable bee forage
 | 1. Suitable bee forage identified as per relevant bee keeping manuals
2. Suitable bee forage are classified as per the ecological zones
3. Suitable bee forage documented as per relevant bee keeping manuals
4. Bee forage gap identified as per the floral calendar.
 |
| 1. Establish bee forage resources
 | 1. Suitable site for establishment identified as per the available resources and ecological zones
2. Method of establishing bee forage resources is adopted.
3. Tools and equipment for establishing bee forage resources identified and assembled as per adopted method.
4. Preparation of the site conducted as per the workplace procedures
5. Forage species planted as per available manuals.
6. ***Post- forage establishment activities*** are conducted as per the workplace procedures.
 |
| 1. Develop a beekeeping flowering calendar
 | 1. ***Bee forage species*** are identified and documented as per available manuals
2. Flowering cycles identified as per the season and ecological zones
3. Floral gaps are identified as per the cycles
4. Flowering cycles documented as per the season and ecological zones
5. The flowering calendar is disseminated as per the workplace procedures
 |
| 1. Conserve forage resources
 | 1. ***Forage conservation methods*** are identified as per relevant manuals
2. Community based conservation is embraced based workplace procedures
3. Suitable forage husbandry , habitat conservation programs adopted as per the workplace procedures
4. Continuous monitoring of bee forage conservation is conducted as per the workplace procedures
 |
| 1. Provide water for bees
 | * 1. The water source is identifiedas per theworkplace procedures
	2. Watering ***equipment and tools*** are identified as per the workplace procedures.
	3. The watering site selected as per the workplace procedures
	4. The water is placed as per the workplace procedures.
	5. Routine replenishment is conducted as per workplace procedures
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variables | RangeMay Includes but not limited to: |
| 1. Forage conservation methods May Includes but not limited to:
 | * Tree nursery establishment
* Agroforestry
* Propagation
* Protection of floral reserves and habitats
 |
| 1. Bee forage species May Includes but not limited to:
 | * Citrus trees
* Avocado
* Key apple
* Eucalyptus
* Passion
* Bananas
* Acacia species
* Cucumber
* Pumpkin
* Bottle brush
* Neem tree
* Calliandra spp
* Coffee
* Croton spp
* Sisal
* Maize
* Sunflower
* Mango tree
* Leucena
* Prosopis
* Dombeya
* Clover
* Macadamia
* Fuchsia spp
* Angels trumpet
* Guava
 |
| 1. Post- forage establishment activities May Includes but not limited to:
 | * Pollarding
* Coppicing
* Weeding
* Pruning
* Pest control
* Thinning
* Transplanting
* Irrigating
* Pegging
* Training
 |
| 1. Equipment and tools May Includes but not limited to:
 | * Buckets
* Watering cans
* Sticks (landing boards)
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Organizing skills
* Analytical skills
* Negotiation skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Water requirements for bees
* Bee forage resources conservation
* Pollen plants and nectar plants
* Flowering cycle
* Bee Botany
* Seed propagation
* Nursery/Seedbed Preparation

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:* 1. Identified , classified and documented suitable bee forage as per relevant bee keeping manuals and the ecological zones
	2. Suitable site for establishment identified as per the available resources and ecological zones
	3. Implemented method of establishing bee forage resources depending on the ecological zones and available resources.
	4. Identified and assembled tools and equipment for establishing bee forage resources as per the method.
	5. conducted site preparation as per the workplace procedures
	6. Planted forage species as per available manuals.
	7. Performed post- forage establishment activities as per the workplace procedures.
	8. identified and documented bee forage species as per available manuals
	9. Identified flowering cycles as per the season and ecological zones
	10. Identified floral gaps as per the cycles
	11. Documented flowering cycles as per the season and ecological zones
	12. identified forage conservation methods as per relevant manuals
	13. Promoted community-based conservation-based workplace procedures
	14. implemented Suitable forage husbandry and habitat conservation programs as per the workplace procedures
	15. conducted Continuous monitoring of bee forage conservation as per the workplace procedures
	16. identified the water sources as per the workplace procedures
	17. Identified watering equipment and tools as per the workplace procedures.
	18. selected the watering site as per the workplace procedures
	19. Placed the water as per the workplace procedures.
	20. Conducted routine replenishment as per workplace procedures
 |
| 1. Resource implications for competence certification
 | The following resources must be provided:* 1. Access to relevant workplace where assessment can take place
	2. Appropriately simulated environment where assessment can take place
	3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Third party reports
	3. Oral questioning
	4. Interview
	5. Observation
 |
| 1. Context of Assessment
 | Assessment could be conducted:* On-the-job
* Off-the–job
* During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with related units in the sector |

# MANAGE HONEY BEE SWARMS

**UNIT CODE:** AGR/OS/API/CR/04/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to manage honey bee swarms. It involves preparing to catch/trap a swarm of honey bees, catching/trapping a swarm of honey bees and Performing post-trapping activities colony

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the **key outcomes** which make up **workplace function**. | **PERFORMANCE CRITERIA**These are **assessable** statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Prepare to catch/trap a swarm of honey bees
 | 1. The number of hives to be stocked determined as per apiary records.
2. A schedule for trapping/catching and stocking honey bee swarms is developed as per workplace procedures
3. Suitable ***trapping sites*** identified as per the relevant bee keeping manuals.
4. Relevant ***tools and equipment*** are identified and assembled as per relevant workplace procedures
5. Suitable PPE are worn as per the occupational safety and health
 |
| 1. Catch/trap a swarm of honey bees
 | 1. The catcher box/ brood box is set at the relevant site
2. The new swarm is transported to the apiary as per the relevant manuals
3. The new colony is hived as per the relevant manuals
 |
| 1. Perform post-trapping activities
 | 1. Regular colony monitoring is conducted to check the progress of the new colony
2. Suitable ***colony management measures*** are applied as per the workplace procedures
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variables | Range |
| 1. Suitable swarming control measure May Includes but not limited to:
 | * Colony division
* Artificial feeding
* Queen cells destruction
* Creating space through supering
* Honey harvesting
* Selection
* De-queening and re-queening
* Providing shade
 |
| 1. Trapping sites May Includes but not limited to:
 | * Bee migratory roots
* Bee reserve/bulking areas
 |
| 1. Tools and equipment May Includes but not limited to:
 | * Smoker
* Catcher
* Rope
* Ladder
* Swarm nets
* Swarm catcher
 |
| 1. Check signs of swarming May Includes but not limited to:
 | * Presence of queen cells along the edges of the comb
* Increase of drawn bees
* Crowding of the hive and hive entrance
* Increased defensiveness
 |
| 1. Colony management measures May Includes but not limited to:
 | * Feeding
* Pest control
* Harvesting
* Adding brood combs
* Merging colonies
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Organizing skills
* Analytical skills
* Negotiation skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking
* Harvesting skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Honey bee behavior
* Transportation of live bees
* Feeding of bees
* Colony management
* Bee selection and multiplication
* Honey harvesting

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:1. Developed a schedule for trapping/catching and stocking honey bee swarms as per workplace procedures
2. Identified suitable trapping sites as per the relevant bee keeping manuals.
3. Identified and assembled relevant tools and equipment as per relevant workplace procedures
4. Identified the number of hives to be stocked as per apiary records.
5. Set the catcher box at the relevant site appropriately
6. Transported the new swarm to the new apiary as per the relevant manuals
7. Hived the new colony as per the relevant manuals
8. Conducted regular colony monitoring to check the progress of the new colony
9. Applied suitable colony management measures as per the workplace procedures
 |
| 1. Resource implications for competence certification
 | The following resources must be provided:* 1. Access to relevant workplace where assessment can take place
	2. Appropriately simulated environment where assessment can take place
	3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Third party reports
	3. Oral questioning
	4. Interview
	5. Observation
 |
| 1. Context of Assessment
 | Assessment could be conducted:* On-the-job
* During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with related units in the sector |

# MANAGE HONEY BEE COLONY

**UNIT CODE:** AGR/OS/API/CR/05/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to manage honey bee colony. It involves preparing for honey bee colony manipulation, handling honey bee combs, handling honey bee colony, raising queen bees and performing post-manipulation practices.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**These are **assessable** statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Prepare for honey bee colony manipulation
 | 1. Manipulation schedule is prepared based on ***apiary records***
2. ***Materials and equipment*** for manipulation are identified as per the workplace procedures/standards.
3. ***Personal protective equipment*** is worn as per the occupational health and safety procedures
 |
| 1. Handle honey bee combs
 | 1. The ***bee hive*** is opened as per workplace procedures
2. ***Combs*** are identified as per the workplace procedures
3. Combs are removed in planned sequence and placed in suitable position.
4. Combs are replaced in same or new sequence/positions or removed to another hive according to the purpose of colony manipulation
 |
| 1. Handle honey bee colony
 | 1. Strong colonies with ***desired characteristics*** are identified based on colony records.
2. ***Tools and equipment for dividing the colony*** are identified and used as per the workplace procedure
3. Honey bee colony is divided as per the workplace procedures
4. Brood nest is renewed as per the workplace procedure and the apiary records
5. The new colony is transferred as per the workplace procedures
6. The honey bee colonies are merged as per the workplace procedures
7. The honey bee colonies are fed as per workplace procedures
8. Colonies for multiplication are selected as per the desirable characteristics
 |
| 1. Rear queen bees
 | 1. ***Colonies*** are identified as per the desirables characteristics
2. ***Tools and equipment*** for colony selection and propagation are prepared as per workplace procedures
3. The colony is de-queened as per the workplace procedures.
4. Queen bees are raised as per the objectives
 |
| 1. Perform post-manipulation practices
 | 1. Honey bee manipulation records are prepared as per the workplace procedures
2. Honey bee manipulation reports are prepared
3. Honey bee colony is monitored as per the records and purpose of manipulation.
4. ***Interventions*** taken depending on the observation.
5. ***Disposable materials*** is ***disposed*** as per the workplace procedures.
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variables | Range |
| 1. Apiary records May Includes but not limited to:
 | * Hive records
* Colony performance records
* Queen records
* Production records
* Colony behavior records
* Forage records
 |
| 1. Materialsand equipment May Includes but not limited to:
 | * Smoker
* Smoker fuel
* Match box
* PPE
* Hive tool
* Bee brush
* Catcher box
* Honey super
* Feeder box
* Feed supplements
 |
| 1. Personal protective equipment May Includes but not limited to:
 | * Veil
* Gloves
* Gumboots
* Hat/cap
 |
| 1. Bee hive May Includes but not limited to:
 | * Langstroth
* Kenya top bar hive
* Frame hive
* Box hive
* Mud hive
* Bark hive
* Bamboo
* Basket
* Log hive
* Observation hive
* Floor hive
 |
| 1. Combs May Includes but not limited to:
 | * Brood combs
* Honey combs
* Pollen combs
* Old combs
* New combs
 |
| 1. Desired characteristics May Includes but not limited to:
 | * Defensiveness
* Less tendency to swarming,
* Productivity, prolific,
* Egg laying rate of the queen
* Pest and disease resistance
 |
| 1. Tools and equipment for dividing the colony May Includes but not limited to:
 | * Catcher box
* Hives
* Hive tools
* PPE
* Bee brush
* Smoker
* Smoker fuel
 |
| 1. Tools and equipment May Includes but not limited to:
 | * Queen cage
* Catcher box
* Feeder box
 |
| 1. Interventions May Includes but not limited to:
 | * Quarantine
* Feeding
* Colony transfer
* Pest and disease control
 |
| 1. Disposable materials May Includes but not limited to:
 | * Infected combs
* Broken
* Damaged
* Old combs
* Damaged top bars or frames
* Dilapidated hives
 |
| 1. Disposal methods May Includes but not limited to:
 | * Recycling
* Burning
* Burying
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Organizing skills
* Negotiation skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Use of tools and accessories
* Type of smoker fuel
* Types of smokers
* Purpose of manipulation
* Types of hives
* Colony behavior
* Weather conditions
* Types of combs and uses
* Desirable characteristics for colony selection and propagation
* Type of hive
* Selection objectives
* Colony multiplication techniques

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:* 1. Prepared Manipulation schedule based on apiary records
	2. Identified materials and equipment for manipulation correctly
	3. Used Personal protective equipment appropriately.
	4. Opened the bee hive as per the workplace procedures.
	5. Identified and rearranged the combs appropriately.
	6. manipulated combs as per the purpose
	7. Identified colonies with desired characteristics based on colony records.
	8. Identified and used tools and equipment for dividing the colony as per the workplace procedure
	9. Divided honey bee colony as per the workplace procedures.
	10. Renewed brood nest as per the workplace procedure and the apiary records
	11. Transferred the new colony as per the workplace procedures
	12. Strengthened bee colony as per workplace procedures
	13. Selected colonies as per the desirable characteristics
	14. Propagated colonies as per the workplace procedures
	15. Prepared honey bee colony records and reports
	16. Monitored honey bee colony as per the records and purpose of manipulation.
	17. Took appropriate action depending on the observation.
	18. Disposed waste according to workplace procedures
 |
| 1. Resource Implications for competence certification
 | The following resources must be provided:* 1. Access to relevant workplace where assessment can take place
	2. Appropriately simulated environment where assessment can take place
	3. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Third party reports
	3. Oral questioning
	4. Interview
	5. Observation
 |
| 1. Context of Assessment
 | Assessment could be conducted:* On-the-job
* During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with related units in the sector |

# CONTROL HONEY BEE PESTS AND DISEASES

**UNIT CODE:** AGR/OS/API/CR/06/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to control pests and disease within a honey bee colony. It involves inspecting the bee colony, assessing health and condition of bee brood, assessing health and condition of adult bees and managing bee pests and diseases.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the **key outcomes** which make up **workplace function**. | **PERFORMANCE CRITERIA**These are **assessable** statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Prepare to inspect the bee colony
 | 1. ***Tools and materials for colony inspection*** identified and assembled according to work place procedures
2. Protective gears are worn as per the workplace procedures
3. Colonies to be inspected are identified based on apiary records
4. Hive is smoked and opened according to workplace procedures
 |
| 1. Assess health and condition of bee brood
 | 1. Brood combs are identified according to the workplace procedures
2. Observation of ***signs and symptoms of pests and diseases*** evidence is doneaccording to bee brood health guidelines
3. Samples for testing are collected as per the workplace procedure.
4. The brood diseases is identified as per bee brood health guidelines
 |
| 1. Assess health and condition of adult bees
 | 1. Bee castes are identified in the colony according to the procedure
2. Observation of signs of pests and diseases in the colony according to bee health guidelines
3. Samples for testing collected based on workplace procedures
4. Biosafety measures implemented as per workplace procedures

3.5 Test results recorded, and relevant remedial action taken as per the workplace procedures  |
| 1. Manage bee pests and diseases
 | 1. Affected colonies are identified according to work place procedure
2. ***Remedial measures*** implemented as per the workplace procedures
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variables | Range |
| 1. Signs of pests and diseases May Includes but not limited to:
 | * Weak and inactive colonies,
* Irregular queen laying patterns
* Buzzing,
* Deformations
* Crawling and dead bees at the hive entrance
* Dying colonies
* Fallen hives
* Poles
* Chalky mummified
 |
| 1. Tools and materials for colony inspection May Includes but not limited to:
 | * Smokers
* Bee brush
* Hive tool
* PPE
* Smoker fuel
* Sample bottles/vials
* Cotton wool
* Preservatives
* Chloroform
 |
| 1. Remedial measures May Includes but not limited to:
 | * Isolated
* Destroyed
* Treated
* Burned
* Buried
* Maintained
* Recycled
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Organizing skills
* Negotiation skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Use of tools and accessories
* Use of the right fuel material for the smoker
* Right approach to the hive
* Hive opening procedure
* Appearance of healthy and unhealthy brood
* Brood pests and diseases
* Castes differentiation
* Bee communication
* Bee pests and disease identification
* Pest infestation
* Differentiation of strong/ weak colonies
* Different pests/ disease control measures

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:* 1. Identified tools and materials for colony inspection according to work place procedures
	2. Wore protective gears as per the workplace procedures
	3. Smoked and opened the hive according to workplace procedures
	4. Identified colonies to be inspected based on apiary records
	5. Identified brood combs according to the workplace procedure
	6. Observed signs and symptoms of pests and diseases evidence according to bee brood health guidelines
	7. Collected samples for testing as per the workplace procedures
	8. Identified infected brood as per bee brood diseases guidelines.
	9. Observed signs of pests and diseases in the colony according to bee health guidelines
	10. Recorded results of inspections and took remedial action
	11. Implemented biosafety measures.
	12. Identified affected colonies according to work place procedure
	13. Implemented remedial measures as per the workplace procedures
 |
| 1. Resource implications for competence certification
 | The following resources must be provided:2.1 Access to relevant workplace where assessment can take place* 1. Appropriately simulated environment where assessment can take place
	2. Materials relevant to the proposed activity or tasks
 |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Third party reports
	3. Oral questioning
	4. Interview
	5. Observation
 |
| 1. Context of Assessment
 | Assessment could be conducted:* On-the-job
* Off-the–job
* During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with related units in the sector |

# HARVEST BEE PRODUCTS

**UNIT CODE:** AGR/OS/API/CR/07/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to harvest bee products. It involves preparing to harvest bee products, conducting bee product harvesting, extracting bee products and performing post-harvest practices.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**These describe the **key outcomes** which make up **workplace function**. | **PERFORMANCE CRITERIA**These are **assessable** statements which specify the required level of performance for each of the elements.***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Prepare to harvest bee products
 | 1. Bee products to be harvested are identified as per the apiary records
2. Colonies to be harvested are identified as per workplace procedures.
3. ***Materials and equipment*** are identified as per workplace procedures.
4. Materials and equipment’s are assembled as per workplace procedures
5. Personal protective equipment are worn as per the occupational health and safety procedures
 |
| 1. Conduct bee product harvesting
 | 1. Hive is opened as per the workplace procedures
2. Ripe honey is harvested as per the workplace procedures
3. Propolis is harvested as per workplace procedures
4. Pollen is trapped and collected as per workplace procedures
5. Bee broods are harvested as per workplace procedures
6. Royal jelly harvested as per workplace procedures
 |
| 1. Extract bee products
 | 1. Bee venom is extracted as per workplace procedures
2. Honey is extracted as per workplace procedures
3. Bees wax extracted as per workplace procedures
 |
| 1. Perform post-harvest practices
 | 1. Bee products are sorted as per workplace procedures
2. Bee products are graded as per the workplace procedures
3. Bee products are weighed based on the workplace procedures
4. ***Bee products production records*** are prepared as per the workplace procedures
5. Bee products transported as per the workplace procedures
6. ***Bee products*** are stored as per health and storage specifications
 |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variables | RangeMay Includes but not limited to: |
| 1. Materials and equipment May Includes but not limited to:
 | * Harvesting and storage containers
* Smokers
* PPE kit
* Bee brush
* Bee escape
 |
| 1. Bee production records May Includes but not limited to:
 | * Quality
* Classification
* Quantity per hive records
 |
| 1. Bee products May Includes but not limited to:
 | * Bees wax
* Pollen
* Royal jelly
* Bee venom
* Bee broods
* Honey
 |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Numeracy
* Digital literacy
* Organizing skills
* Analytical skills
* Negotiation skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking
* Harvesting techniques
* Extraction techniques
* Appropriate use of tools and equipment.
* Bee products handling

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Types of bee products
* Equipment and techniques in bee product harvesting
* Types of PPE
* Safe use of tools and equipment
* Bee behavior
* Equipment for extraction
* Bee products harvesting, grading and storage.
* Bee products uses

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency
 | Assessment requires evidence that the candidate:1. Identified colonies to be harvested as per workplace procedures.
2. Identified and assembled Materials and equipment
3. Used personal protective equipment as per the occupational health and safety procedures
4. Opened hive as per the workplace procedures
5. Harvested ripe honey , propolis, pollen, bee broods and royal jelly as per the workplace procedures
6. Extracted bee venom , honey, bees wax and pollen as per workplace procedures
7. Weighed and graded bee products based on the workplace procedures
8. Prepared bee products production records as per the workplace procedures
9. Stored bee products as per health and storage specifications
 |
| 1. Resource Implications for competence certification
 | The following resources must be provided:2.1 Access to relevant workplace where assessment can take place2.2 Appropriately simulated environment where assessment can take place 2.3 Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment
 | Competency may be assessed through:* 1. Written tests
	2. Third party reports
	3. Oral questioning
	4. Interview
	5. Observation
 |
| 1. Context of Assessment
 | Assessment could be conducted:* On-the-job
* During industrial attachment
 |
| 1. Guidance information for assessment
 | Holistic assessment with related units in the sector |