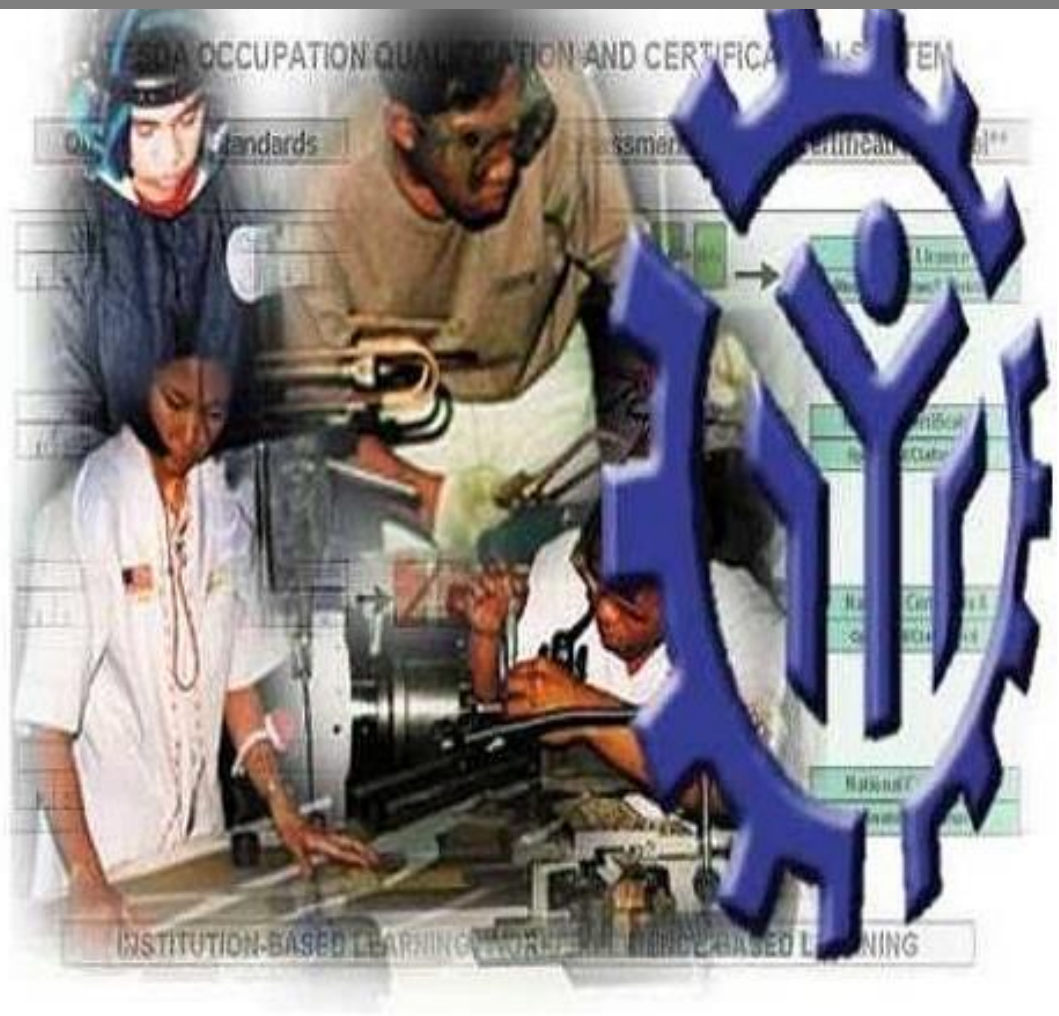
TRAINING REGULATIONS

BEEKEEPING NC II



AGRICULTURE, FORESTRY AND FISHERY SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Luzon Expressway (SLEx), Fort Bonifacio, Taguig City, Metro Manila
Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, “Establishment and Administration of the National Trade Skills Standards” of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skills standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1 Competency assessment and certification;

2 Registration and delivery of training programs; and

3 Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 **Definition of Qualification** - describes the qualification and defines the competencies that comprise the qualification.

Section 2 **Competency Standards** - was revised to include the Required Knowledge and Required Skills per element. These fields explicitly state the required knowledge and skills for competent performance of a unit of competency in an informed and effective manner. These also emphasize the application of knowledge and skills to situations where understanding is converted into a workplace outcome.

Section 3 **Training Arrangements** - contain information and requirements which serve as bases for training providers in designing and delivering competency-based curriculum for the qualification. The revisions to section 3 entail identifying the Learning Activities leading to achievement of the identified Learning Outcome per unit of competency.

Section 4 **Assessment and Certification Arrangements** - describe the policies governing assessment and certification procedures for the qualification.

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TRAINING REGULATIONS FOR

BEEKEEPING NC II

Section 1 BEEKEEPING NC II

The BEEKEEPING NC II Qualification consists of competencies required to establish hived colonies in a bee yard, manage bee colonies, propagate bee colonies, conduct harvesting operations, and provide bee pollination services. This qualification covers handling different species of bees including domesticated and wild species. Harvesting activities end until extraction of raw honey. Application of health and safety measures is required in performing every task.

The units of competency comprising this qualification include the following:

Code	**BASIC COMPETENCIES**
400311210	Participate in workplace communication
400311211	Work in team environment
400311212	Solve/address general workplace problems
400311213	Develop career and life decisions
400311214	Contribute to workplace innovation
400311215	Present relevant information
400311216	Practice occupational safety and health policies and procedures
400311217	Exercise efficient and effective sustainable practices in the workplace
400311218	Practice entrepreneurial skills in the workplace
Code	**COMMON COMPETENCIES**
AFF321207	Apply Safety Measures in Farm Operations
AFF321208	Use Farm Tools and Equipment
AFF321203	Perform Estimation and Basic Calculation
Code	**CORE COMPETENCIES**
AFF612308	Establish hived colonies in a bee yard
AFF612309	Manage bee colony
AFF612310	Propagate bee colony
AFF612311	Conduct harvesting operation
AFF612312	Provide pollination services

A person who has achieved this Competency Standard is competent to be:

- Beekeeper
- Apiary worker
- Field bee technician

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in **BEEKEEPING NC II.**

BASIC COMPETENCIES

UNIT OF COMPETENCY: PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 400311210

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace 1.7 procedures for the	1.1 Effective verbal and nonverbal communication 1.2 Different modes of communication 1.3 Medium of communication in the workplace 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Lines of Communication 1.7 Technology relevant to the enterprise and the individual's work responsibilities 1.8 Workplace etiquette	1.1 Following simple spoken language 1.2 Performing routine workplace duties following simple written notices 1.3 Participating in workplace meetings and discussions 1.4 Preparing work-related documents 1.5 Estimating, calculating and recording routine workplace measures 1.6 Relating/ Interacting with people of various levels in the workplace

	1.8 location and ***storage*** 1.9 of information are used 1.10 Personal interaction is carried out clearly and concisely		1.7 Gathering and providing basic information in response to workplace requirements 1.8 Basic business writing skills 1.9 Interpersonal skills in the workplace 1.10 Active-listening skills
2. Perform duties following workplace instructions	2.1 Written notices and instructions are read and interpreted in accordance with organizational guidelines 2.2 Routine written instruction are followed based on established procedures 2.3 Feedback is given to workplace supervisor based instructions/ information received 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Where necessary, clarifications about routine workplace procedures and matters concerning conditions of employment are sought and asked from ***appropriate sources*** 2.7 Meetings outcomes are interpreted and implemented	2.1 Effective verbal and non-verbal communication 2.2 Different modes of communication 2.3 Medium of communication in the workplace 2.4 Organizational/ Workplace policies 2.5 Communication procedures and systems 2.6 Lines of communication 2.7 Technology relevant to the enterprise and the individual's work responsibilities 2.8 Effective questioning techniques (clarifying and probing) 2.9 Workplace etiquette	2.1 Following simple spoken instructions 2.2 Performing routine workplace duties following simple written notices 2.3 Participating in workplace meetings and discussions 2.4 Completing work- related documents 2.5 Estimating, calculating and recording routine workplace measures 2.6 Relating/ Responding to people of various levels in the workplace 2.7 Gathering and providing information in response to workplace requirements

			2.8 Basic questioning/querying 2.9 Skills in reading for information 2.10 Skills in locating
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Errors in recording information on forms/ documents are identified and acted upon 3.4 Reporting requirements to supervisor are completed according to organizational guidelines	3.1 Effective verbal and non-verbal communication 3.2 Different modes of communication 3.3 Workplace forms and documents 3.4 Organizational/ Workplace policies 3.5 Communication procedures and systems 3.6 Technology relevant to the enterprise and the individual's work responsibilities	3.1 Completing work- related documents 3.2 Applying operations of addition, subtraction, division and multiplication 3.3 Gathering and providing information in response to workplace requirements 3.4 Effective record keeping skills

RANGE OF VARIABLES

VARIABLES	RANGE
1. Appropriate sources	May include: 1.1. Team members 1.2. Supervisor/Department Head 1.3. Suppliers 1.4. Trade personnel 1.5. Local government 1.6. Industry bodies
2. Medium	May include: 2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information dissemination 2.5. Follow-up or verbal instructions 2.6. Face-to-face communication 2.7. Electronic media (disk files, cyberspace)
3. Storage	May include: 3.1. Manual filing system 3.2. Computer-based filing system
4. Workplace interactions	May include: 4.1. Face-to-face 4.2. Telephone 4.3. Electronic and two-way radio 4.4. Written including electronic means, memos, instruction and forms 4.5. Non-verbal including gestures, signals, signs and diagrams
5. Forms	May include: 5.1. HR/Personnel forms, telephone message forms, safety reports

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Prepared written communication following standard format of the organization 1.2. Accessed information using workplace communication equipment/systems 1.3. Made use of relevant terms as an aid to transfer information effectively 1.4. Conveyed information effectively adopting formal or informal communication
2. Resource Implications	**The following resources should be provided:** 2.1. Fax machine 2.2. Telephone 2.3. Notebook 2.4. Writing materials 2.5. Computer with Internet connection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Demonstration with oral questioning 3.2. Interview 3.3. Written test 3.4. Third-party report
4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or through an accredited institution

UNIT OF COMPETENCY : WORK IN A TEAM ENVIRONMENT

UNIT CODE : 400311211

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify one's roles and responsibilities as a member of a team.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Describe team role and scope	1.1 The ***role and objective of the team*** is identified from available ***sources of information*** 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources	1.1 Group structure 1.2 Group development 1.3 Sources of information	1.1 Communicating with others, appropriately consistent with the culture of the workplace 1.2 Developing ways in improving work structure and performing respective roles in the group or organization
2. Identify one's role and responsibility within a team	2.1 Individual roles and responsibilities within the team environment are identified 2.2 Roles and objectives of the team is identified from available ***sources of information*** 2.3 Team parameters, reporting relationships and responsibilities are identified based on team discussions and appropriate external sources	2.1 Team roles and objectives 2.2 Team structure and parameters 2.3 Team development 2.4 Sources of information	2.1 Communicating with others, appropriately consistent with the culture of the workplace 2.2 Developing ways in improving work structure and performing respective roles in the group or organization

3. Work as a team member	3.1 Effective and appropriate forms of communications are used and interactions undertaken with team members based on company practices. 3.2 Effective and appropriate contributions made to complement team activities and objectives, based on ***workplace context*** 3.3 Protocols in reporting are observed based on standard company practices. 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives	3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning and decision making 3.4 Team thinking 3.5 Team roles 3.6 Process of team development 3.7 Workplace context	3.1 Communicating appropriately, consistent with the culture of the workplace 3.2 Interacting effectively with others 3.3 Deciding as an individual and as a group using group think strategies and techniques 3.4 Contributing to Resolution of issues and concerns

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	May include but not limited to: 1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	May include but not limited to: 2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Client/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards
3. Workplace context	May include but not limited to: 3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Worked in a team to complete workplace activity 1.2 Worked effectively with others 1.3 Conveyed information in written or oral form 1.4 Selected and used appropriate workplace language 1.5 Followed designated work plan for the job
2. Resource Implications	**The following resources should be provided:** 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Role play involving the participation of individual member to the attainment of organizational goal 3.2 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork 3.3 Socio-drama and socio-metric methods 3.4 Sensitivity techniques 3.5 Written Test
4. Context for Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY : SOLVE/ADDRESS GENERAL WORKPLACE

UNIT CODE : 400311212

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply problem-solving techniques to determine the origin of problems and plan for their resolution. It also includes addressing procedural problems through documentation, and referral.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify routine problems	1.1 Routine **problems or procedural problem** areas are identified 1.2 Problems to be investigated are defined and determined 1.3 Current conditions of the problem are identified and documented	1.1 Current industry hardware and software products and services 1.2 Industry maintenance, service and helpdesk practices, processes and procedures 1.3 Industry standard diagnostic tools 1.4 Malfunctions and resolutions	1.1 Identifying current industry hardware and software products and services 1.2 Identifying current industry maintenance, services and helpdesk practices, processes and procedures. 1.3 Identifying current industry standard diagnostic tools 1.4 Describing common malfunctions and resolutions. 1.5 Determining the root cause of a routine malfunction

2. Look for solutions to routine problems	2.1 Potential solutions to problem are identified 2.2 Recommendations about possible solutions are developed, ***documented***, ranked and presented to ***appropriate person*** for decision	2.1 Current industry hardware and software products and services 2.2 Industry service and helpdesk practices, processes and procedures 2.3 Operating systems 2.4 Industry standard diagnostic tools 2.5 Malfunctions and resolutions. 2.6 Root cause analysis	2.1 Identifying current industry hardware and software products and services 2.2 Identifying services and helpdesk practices, processes and procedures. 2.3 Identifying operating system 2.4 Identifying current industry standard diagnostic tools 2.5 Describing common malfunctions and resolutions. 2.6 Determining the root cause of a routine malfunction
3. Recommend solutions to problems	3.1 Implementation of solutions are **planned** 3.2 Evaluation of implemented solutions are planned 3.3 Recommended solutions are documented and submit to appropriate person for confirmation	3.1 Standard procedures 3.2 Documentation produce	3.1 Producing documentation that recommends solutions to problems 3.2 Following established procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Problems/Procedural Problem	May include but not limited to: 1.1 Routine/non – routine processes and quality problems 1.2 Equipment selection, availability and failure 1.3 Teamwork and work allocation problem 1.4 Safety and emergency situations and incidents 1.5 Work-related problems outside of own work area
2. Appropriate person	May include but not limited to: 2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization
3. Document	May include but not limited to: 3.1 Electronic mail 3.2 Briefing notes 3.3 Written report 3.4 Evaluation report
4. Plan	May include but not limited to: 4.1 Priority requirements 4.2 Co-ordination and feedback requirements 4.3 Safety requirements 4.4 Risk assessment 4.5 Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined the root cause of a routine problem 1.2 Identified solutions to procedural problems. 1.3 Produced documentation that recommends solutions to problems. 1.4 Followed established procedures. 1.5 Referred unresolved problems to support persons.
2. Resource Implications	2.1. Assessment will require access to a workplace over an extended period, or a suitable method of gathering evidence of operating ability over a range of situations.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Case Formulation 3.2 Life Narrative Inquiry 3.3 Standardized test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : DEVELOP CAREER AND LIFE DECISIONS

UNIT CODE : 400311213

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitudes in managing one's emotions, developing reflective practice, and boosting self-confidence and developing self-regulation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Manage one's emotion	1.1 **Self-management strategies** are identified 1.2 Skills to work independently and to show initiative, to be conscientious, and persevering in the face of setbacks and frustrations are developed 1.3 Techniques for effectively handling negative emotions and **unpleasant situation i**n the workplace are examined	1.1 Self-management strategies that assist in regulating behavior and achieving personal and learning goals (e.g. Nine self-management strategies according to Robert Kelley) 1.2 Enablers and barriers in achieving personal and career goals 1.3 Techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc.	1.1 Managing properly one's emotions and recognizing situations that cannot be changed and accept them and remain professional 1.2 Developing self-discipline, working independently and showing initiative to achieve personal and career goals 1.3 Showing confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace
2. Develop reflective practice	2.1 Personal strengths and achievements, based on self-	2.1 Basic SWOT analysis	2.1 Using the basic SWOT analysis as self-

	assessment strategies and teacher feedback are contemplated 2.2 Progress when seeking and responding to feedback from teachers to assist them in consolidating strengths, addressing weaknesses and fulfilling their potential are monitored 2.3 Outcomes of personal and academic challenges by reflecting on previous problem solving and decision making strategies and feedback from peers and teachers are predicted	2.2 Strategies to improve one's attitude in the workplace 2.3 Gibbs' Reflective Cycle/Model (Description, Feelings, Evaluation, Analysis, Conclusion, and Action plan)	assessment strategy 2.2 Developing reflective practice through realization of limitations, likes/ dislikes; through showing of self-confidence 2.3 Demonstrating self-acceptance and being able to accept challenges
3. Boost self-confidence and develop self-regulation	3.1 Efforts for continuous self-improvement are demonstrated 3.2 Counter-productive tendencies at work are eliminated 3.3 Positive outlook in life are maintained.	3.1 Four components of self-regulation based on Self-Regulation Theory (SRT) 3.2 Personality development concepts 3.3 Self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts)	3.1 Performing effective communication skills – reading, writing, conversing skills 3.2 Showing affective skills – flexibility, adaptability, etc. 3.3 Self-assessment for determining one's strengths and weaknesses

RANGE OF VARIABLES

VARIABLE	RANGE
1. Self-management strategies	**May include but not limited to:** 1.1 Seeking assistance in the form of job coaching or mentoring 1.2 Continuing dialogue to tackle workplace grievances 1.3 Collective negotiation/bargaining for better working conditions 1.4 Share your goals to improve with a trusted co-worker or supervisor 1.5 Make a negativity log of every instance when you catch yourself complaining to others 1.6 Make lists and schedules for necessary activities
2. Unpleasant situation	**May include but not limited to:** 2.1 Job burn-out 2.2 Drug dependence 2.3 Sulking

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Express emotions appropriately 1.2 Work independently and show initiative 1.3 Consistently demonstrate self-confidence and self-discipline
2. Resource Implications	**The following resources should be provided:** 2.1. Access to workplace and resource s 2.2. Case studies
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Demonstration or simulation with oral questioning 3.2. Case problems involving work improvement and sustainability issues 3.3. Third-party report
4. Context for Assessment	4.1. Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : CONTRIBUTE TO WORKPLACE INNOVATION

UNIT CODE : 400311214

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to make a pro-active and positive contribution to workplace innovation.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify opportunities to do things better.	1.1 ***Opportunities for improvement*** are identified proactively in own area of work. 1.2 ***Information*** are gathered and reviewed which may be relevant to ideas and which might assist in gaining support for idea.	1.1 Roles of individuals in suggesting and making improvements. 1.2 Positive impacts and challenges in innovation. 1.3 Types of changes and responsibility. 1.4 Seven habits of highly effective people.	1.1 Identifying opportunities to improve and to do things better. Involvement. 1.2 Identifying the positive impacts and the challenges of change and innovation. 1.3 Identifying examples of the types of changes that are within and outside own scope of responsibility
2. Discuss and develop ideas with others	2.1 ***People who could provide input*** to ideas for improvements are identified. 2.2 Ways of approaching people to begin sharing ideas are selected. 2.3 Meeting is set with relevant people. 2.4 Ideas for follow up are review and selected based on feedback.	2.1 Roles of individuals in suggesting and making improvements. 2.2 Positive impacts and challenges in innovation. 2.3 Types of changes and responsibility. 2.4 Seven habits of highly effective people.	2.1 Identifying opportunities to improve and to do things better. Involvement. 2.2 Identifying the positive impacts and the challenges of change and innovation. 2.3 Providing examples of the types of changes that are within and

	2.5 ***Critical inquiry method*** is used to discuss and develop ideas with others.		outside own scope of responsibility 2.4 Communicating ideas for change through small group discussions and meetings.
3. Integrate ideas for change in the workplace.	3.1 Critical inquiry method is used to integrate different ideas for change of key people. 3.2 Summarizing, analyzing and generalizing skills are used to extract salient points in the pool of ideas. 3.3 ***Reporting skills*** are likewise used to communicate results. 3.4 ***Current Issues and concerns*** on the systems, processes and procedures, as well as the need for simple innovative practices are identified.	3.1 Roles of individuals in suggesting and making improvements. 3.2 Positive impacts and challenges in innovation. 3.3 Types of changes and responsibility. 3.4 Seven habits of highly effective people. 3.5 Basic research skills.	3.1 Identifying opportunities to improve and to do things better. Involvement. 3.2 Identifying the positive impacts and the challenges of change and innovation. 3.3 Providing examples of the types of changes that are within and outside own scope of responsibility. 3.4 Communicating ideas for change through small group discussions and meetings. 3.5 Demonstrating skills in analysis and interpretation of data.

RANGE OF VARIABLES

VARIABLES	RANGE
1. Opportunities for improvement	May include: 1.1 Systems 1.2 Processes 1.3 Procedures 1.4 Protocols 1.5 Codes 1.6 Practices
2. Information	May include: 2.1 Workplace communication problems. 2.2 Performance evaluation results. 2.3 Team dynamics issues and concerns. 2.4 Challenges on return of investment 2.5 New tools, processes and procedures. 2.6 New people in the organization.
3. People who could provide input	May include: 3.1 Leaders. 3.2 Managers. 3.3 Specialists. 3.4 Associates. 3.5 Researchers. 3.6 Supervisors. 3.7 Staff. 3.8 Consultants (external) 3.9 People outside the organization in the same field or similar expertise/industry. 3.10 Clients
4. Critical inquiry method	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations.

5. Reporting skills	May include: 5.1 Data management. 5.2 Coding. 5.3 Data analysis and interpretation. 5.4 Coherent writing. 5.5 Speaking.

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified opportunities to do things better. 1.2 Discussed and developed ideas with others on how to contribute to workplace innovation. 1.3 Integrated ideas for change in the workplace. 1.4 Analyzed and reported rooms for innovation and learning in the workplace.
2. Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : PRESENT RELEVANT INFORMATION

UNIT CODE : 400311215

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to present data/information appropriately.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Gather data/ information	1.1 Evidence, facts and information are collected 1.2 Evaluation, terms of reference and conditions are reviewed to determine whether data/information falls within project scope	1.1 Organisational protocols 1.2 Confidentiality 1.3 Accuracy 1.4 Business mathematics and statistics 1.5 Data analysis techniques/procedures 1.6 Reporting requirements to a range of audiences 1.7 Legislation, policy and procedures relating to the conduct of evaluations 1.8 Organisational values, ethics and codes of conduct	1.1 Describing organisational protocols relating to client liaison 1.2 Protecting confidentiality 1.3 Describing accuracy 1.4 Computing business mathematics and statistics 1.5 Describing data analysis techniques/ procedures 1.6 Reporting requirements to a range of audiences 1.7 Stating legislation, policy and procedures relating to the conduct of evaluations 1.8 Stating organisational values, ethics and codes of conduct

2. Assess gathered data/ information	2.1 Validity of data/ information is assessed 2.2 Analysis techniques are applied to assess data/ information. 2.3 Trends and anomalies are identified 2.4 ***Data analysis techniques*** and procedures are documented 2.5 Recommendations are made on areas of possible improvement.	2.1 Business mathematics and statistics 2.2 Data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Legislation, policy and procedures relating to the conduct of evaluations 2.5 Organisational values, ethics and codes of conduct	2.1 Computing business mathematics and statistics 2.2 Describing data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Stating legislation, policy and procedures relating to the conduct of evaluations 2.5 Stating organisational values, ethics and codes of conduct
3. Record and present information	3.1 Studied data/information are recorded. 3.2 Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference. 3.3 Interim and final reports are analysed and outcomes are compared to the criteria established at the outset. 3.4 Findings are presented to stakeholders.	3.1 Data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Legislation, policy and procedures relating to the conduct of evaluations 3.4 Organisational values, ethics and codes of conduct	3.1 Describing data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Stating legislation, policy and procedures relating to the conduct of evaluations 3.4 Stating organisational values, ethics and codes of conduct practices

RANGE OF VARIABLES

VARIABLES	RANGE
1. Data analysis techniques	May include but not limited to: 1.1. Domain analysis 1.2. Content analysis 1.3. Comparison technique

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determine data / information 1.2 Studied and applied gathered data/information 1.3 Recorded and studied studied data/information These aspects may be best assessed using a range of scenarios what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
2. Resource Implications	**Specific resources for assessment** 2.1. Evidence of competent performance should be obtained by observing an individual in an information management role within the workplace or operational or simulated environment.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Written Test 3.2. Interview 3.3. Portfolio The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1. In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : PRACTICE OCCUPATIONAL SAFETY AND HEALTH POLICIES AND PROCEDURES

UNIT CODE : 400311216

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to identify OSH compliance requirements, prepare OSH requirements for compliance, perform tasks in accordance with relevant OSH policies and procedures.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify OSH compliance requirements	1.1 Relevant ***OSH requirements, regulations, policies and procedures*** are identified in accordance with workplace policies and procedures 1.2 OSH activity non-conformities are conveyed to ***appropriate personnel*** 1.3 ***OSH preventive and control requirements*** are identified in accordance with OSH work policies and procedures	1.1. OSH preventive and control requirements 1.2. Hierarchy of Controls 1.3. Hazard Prevention and Control 1.4. General OSH principles 1.5. Work standards and procedures 1.6. Safe handling procedures of tools, equipment and materials 1.7. Standard emergency plan and procedures in the workplace	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Prepare OSH requirements for compliance	2.1 OSH work activity material, tools and equipment requirements are identified in accordance with workplace policies and procedures 2.2 Required OSH materials, tools	2.1 Resources necessary to execute hierarchy of controls 2.2 General OSH principles 2.3 Work standards and procedures 2.4 Safe handling procedures of	2.1 Communication skills 2.2 Estimation skills 2.3 Interpersonal skills 2.4 Critical thinking skills 2.5 Observation skills

	and equipment are acquired in accordance with workplace policies and procedures 2.3 Required OSH materials, tools and equipment are arranged/ placed in accordance with OSH work standards	tools, equipment and materials 2.5 Different OSH control measures	2.6 Material, tool and equipment identification skills
3. Perform tasks in accordance with relevant OSH policies and procedures	3.1 Relevant OSH work procedures are identified in accordance with workplace policies and procedures 3.2 Work Activities are executed in accordance with OSH work standards 3.3 ***Non-compliance work activities*** are reported to *appropriate personnel*	3.1 OSH work standards 3.2 Industry related work activities 3.3 General OSH principles 3.4 OSH Violations 3.5 Non-compliance work activities	3.1 Communication skills 3.2 Interpersonal skills 3.3 Troubleshooting skills 3.4 Critical thinking skills 3.5 Observation skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Requirements, Regulations, Policies and Procedures	May include: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Permit to Operate 1.6 Philippine Occupational Safety and Health Standards 1.7 Department Order No. 13 (Construction Safety and Health) 1.8 ECC regulations
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself
3. OSH Preventive and Control Requirements	May include: 3.1 Resources needed for removing hazard effectively 3.2 Resources needed for substitution or replacement 3.3 Resources needed to establishing engineering controls 3.4 Resources needed for enforcing administrative controls 3.5 Personal Protective equipment
4. Non OSH-Compliance Work Activities	May include non-compliance or observance of the following safety measures: 4.1 Violations that may lead to serious physical harm or death 4.2 Fall Protection 4.3 Hazard Communication 4.4 Respiratory Protection 4.5 Power Industrial Trucks 4.6 Lockout/Tag-out 4.7 Working at heights (use of ladder, scaffolding) 4.8 Electrical Wiring Methods 4.9 Machine Guarding 4.10 Electrical General Requirements 4.11 Asbestos work requirements 4.12 Excavations work requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Convey OSH work non-conformities to appropriate personnel 1.2. Identify OSH preventive and control requirements in accordance with OSH work policies and procedures 1.3. Identify OSH work activity material, tools and equipment requirements in accordance with workplace policies and procedures 1.4. Arrange/Place required OSH materials, tools and equipment in accordance with OSH work standards 1.5. Execute work activities in accordance with OSH work standards 1.6. Report OSH activity non-compliance work activities to appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Facilities, materials tools and equipment necessary for the activity
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation/Demonstration with oral questioning 3.2 Third party report
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : EXERCISE EFFICIENT AND EFFECTIVE SUSTAINABLE PRACTICES IN THE WORKPLACE

UNIT CODE : 400311217

UNIT DESCRIPTOR : This unit covers knowledge, skills and attitude to identify the efficiency and effectiveness of resource utilization, determine causes of inefficiency and/or ineffectiveness of resource utilization and convey inefficient and ineffective environmental practices

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the efficiency and effectiveness of resource utilization	1.1 Required resource utilization in the workplace is measured using appropriate techniques 1.2 Data are recorded in accordance with workplace protocol 1.3 Recorded data are compared to determine the efficiency and effectiveness of resource utilization according to established ***environmental work procedures***	1.1 Importance of Environmental Literacy 1.2 Environmental Work Procedures 1.3 Waste Minimization 1.4 Efficient Energy Consumptions	1.1 Recording Skills 1.2 Writing Skills 1.3 Innovation Skills
2. Determine causes of inefficiency and/or ineffectiveness of resource utilization	2.1 Potential causes of inefficiency and/or ineffectiveness are listed 2.2 Causes of inefficiency and/or	2.1 Causes of environmental inefficiencies and ineffectiveness	2.1 Deductive Reasoning Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills

	ineffectiveness are identified through deductive reasoning 2.3 Identified causes of inefficiency and/or ineffectiveness are validated thru established environmental procedures		
3. Convey inefficient and ineffective environmental practices	3.1 Efficiency and effectiveness of resource utilization are reported to *appropriate personnel* 3.2 Concerns related resource utilization are discussed with appropriate personnel 3.3 Feedback on information/ concerns raised are clarified with appropriate personnel	3.1 Appropriate Personnel to address the environmental hazards 3.2 Environmental corrective actions	3.1 Written and Oral Communication Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills 3.5 Practice Environmental Awareness

RANGE OF VARIABLES

VARIABLE	RANGE
1. Environmental Work Procedures	May include: 1.1 Utilization of Energy, Water, Fuel Procedures 1.2 Waster Segregation Procedures 1.3 Waste Disposal and Reuse Procedures 1.4 Waste Collection Procedures 1.5 Usage of Hazardous Materials Procedures 1.6 Chemical Application Procedures 1.7 Labeling Procedures
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Measured required resource utilization in the workplace using appropriate techniques 1.2. Recorded data in accordance with workplace protocol 1.3. Identified causes of inefficiency and/or ineffectiveness through deductive reasoning 1.4. Validate the identified causes of inefficiency and/or ineffectiveness thru established environmental procedures 1.5. Report efficiency and effectives of resource utilization to appropriate personnel 1.6. Clarify feedback on information/concerns raised with appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace 2.2 Tools, materials and equipment relevant to the tasks 2.3 PPE 2.4 Manuals and references
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Demonstration 3.2 Oral questioning

	3.3 Written examination
4. Context for Assessment	4.1 Competency assessment may occur in workplace or any appropriately simulated environment 4.2 Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY : PRACTICE ENTREPRENEURIAL SKILLS IN THE WORKPLACE

UNIT CODE : 400311218

UNIT DESCRIPTOR : This unit covers the outcomes required to apply entrepreneurial workplace best practices and implement cost-effective operations

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
Apply entrepreneurial workplace best practices	1.1 ***Good practices*** relating to workplace operations are observed and selected following workplace policy. 1.2 Quality procedures and practices are complied with according to workplace requirements. 1.3 Cost-conscious habits in ***resource utilization*** are applied based on industry standards.	1.1 Workplace best practices, policies and criteria 1.2 Resource utilization 1.3 Ways in fostering entrepreneurial attitudes: 1.3.1 Patience 1.3.2 Honesty 1.3.3 Quality-consciousness 1.3.4 Safety-consciousness 1.3.5 Resourcefulness	1.1 Communication skills 1.2 Complying with quality procedures
2. Communicate entrepreneurial workplace best practices	2.1 Observed good practices relating to workplace operations are communicated to **appropriate person**. 2.2 Observed quality procedures and practices are	2.1 Workplace best practices, policies and criteria 2.2 Resource utilization 2.3 Ways in fostering entrepreneurial attitudes: 2.3.1 Patience 2.3.2 Honesty	2.1 Communication skills 2.2 Complying with quality procedures 2.3 Following workplace communication protocol

	communicated to appropriate person 2.3 Cost-conscious habits in resource utilization are communicated based on industry standards.	2.3.3 Quality-consciousness 2.3.4 Safety-consciousness 2.3.5 Resourcefulness	
3. Implement cost-effective operations	3.1 Preservation and optimization of workplace resources is implemented in accordance with enterprise policy 3.2 Judicious use of workplace tools, equipment and materials are observed according to manual and work requirements. 3.3 Constructive contributions to office operations are made according to enterprise requirements. 3.4 Ability to work within one's allotted time and finances is sustained.	3.1 Optimization of workplace resources 3.2 5S procedures and concepts 3.3 Criteria for cost-effectiveness 3.4 Workplace productivity 3.5 Impact of entrepreneurial mindset to workplace productivity 3.6 Ways in fostering entrepreneurial attitudes: 3.7 Quality-consciousness 3.8 Safety-consciousness	3.1 Implementing preservation and optimizing workplace resources 3.2 Observing judicious use of workplace tools, equipment and materials 3.3 Making constructive contributions to office operations 3.4 Sustaining ability to work within allotted time and finances

RANGE OF VARIABLES

VARIABLE	RANGE
1.Good practices	May include: 1.1 Economy in use of resources 1.2 Documentation of quality practices
2.Resources utilization	May include: 2.1 Consumption/ use of consumables 2.2 Use/Maintenance of assigned equipment and furniture 2.3 Optimum use of allotted /available time

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated ability to identify and sustain cost-effective activities in the workplace 1.2 Demonstrated ability to practice entrepreneurial knowledge, skills and attitudes in the workplace.
2. Resource Implications	The following resources should be provided: 2.1 Simulated or actual workplace 2.2 Tools, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals 2.3.1 Enterprise procedures manuals 2.3.2 Company quality policy
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Interview 3.2 Third-party report
4.Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT OF COMPETENCY : APPLY SAFETY MEASURES IN FARM OPERATIONS
UNIT CODE : AFF321207
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform safety measures effectively and efficiently. It includes identifying areas, tools, materials, time and place in performing safety measures.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine areas of concern for safety measures	1.1 ***Work tasks*** are identified in line with farm operations 1.2 ***Place*** for safety measures are determined in line with farm operations 1.3 ***Time*** for safety measures are determined in line with farm operations 1.4 Appropriate ***tools, materials and outfits*** are prepared in line with job requirements	1.1 Different work tasks in farm operations 1.2 Place and time for implementation of safety measures 1.3 Different hazards in the workplace 1.4 Types of tools, materials and outfits 1.5 Preparation of tools, materials and outfits	1.1 Identifying work tasks in farm operations 1.2 Determining place and time for implementation of safety measures 1.3 Reading labels, manuals and other basic safety information 1.4 Identifying effective/ functional tools, materials and outfit 1.5 Preparing tools, materials and outfits 1.6 Discarding defective tools, and materials

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Apply appropriate safety measures	2.1 Tools and materials are used according to specifications and procedures 2.2 Outfits are worn according to farm requirements 2.3 Effectivity/shelf life/expiration of materials are strictly observed 2.4 ***Emergency procedures*** are known and followed to ensure a safe work requirement 2.5 Hazards in the workplace are identified and reported in line with farm guidelines	2.1 Uses and functions of tools 2.2 Outfits and how to wear it. 2.3 Expiration/shelf life of materials 2.4 Proper disposal of expired materials 2.5 Environmental rules and regulations 2.6 Emergency procedures 2.7 Hazards identification and reporting 2.8 Communication skills 2.9 OSHS	2.1 Using tools and materials in the workplace 2.2 Wearing of outfits 2.3 Observing expiration/shelf life of materials 2.4 Disposing of expired materials 2.5 Following emergency procedures 2.6 Identifying and reporting of hazards in workplace area.
3. Safekeep /dispose tools, materials and outfit	3.1 Used tools and outfit are cleaned after use and stored in designated areas. 3.2 Unused materials are properly labeled and stored according to manufacturer's recommendation and farm requirements. 3.3 Waste materials are disposed according to manufacturers, government and farm requirements.	3.1 Procedures of cleaning used tools and outfits 3.2 Label and storage unused materials 3.3 Disposal of wastes materials 3.4 Manufacturers' recommendation on keeping materials 3.5 Environmental rules and regulations	3.1 Cleaning used tools and outfit 3.2 Labelling and storing unused materials 3.3 Disposing waste materials

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work tasks	Work task may be selected from any of the subsectors: 1.1 Crop Production 1.2 Post –harvesting 1.3 Agri-marketing 1.4 Farm equipment 1.5 Follow routine apiary procedure 1.6 Maintain bee forage resources 1.7 Control bee pests and diseases 1.8 Provide feeding supplement 1.9 Divide the colony 1.10 Introduce new queen 1.11 Harvest and process bee products 1.12 Optimize colonies to be used for pollination services
2. Place	May include: 2.1 Stock room/storage areas/warehouse 2.2 Field/farm/orchard
3. Time	May include: 3.1 Fertilizer and pesticides application 3.2 Feed mixing and feeding 3.3 Harvesting and hauling 3.4 Building up of starter colonies 3.5 Adding frames and wax foundation sheets 3.6 Supplemental feeding of the colonies 3.7 Control of bee mites and diseases 3.8 Placement of super and additional frames with wax foundation 3.9 Swarm control 3.10 Honey harvesting and processing 3.11 Splitting of the colony

4. Tools, materials and outfit	Tools 3.1 Wrenches 3.2 Screw driver 3.3 Pliers 3.4 Multi scraper (hive tool- can be fabricated) 3.5 Bee brush 3.6 Hive brush 3.7 Hive tool 3.8 Airtight fire proof box Materials 3.9 Wire 3.10 Nails 3.11 Box of matches or lighter 3.12 Smoker fuel 3.13 Bucket water 3.14 Soap 3.15 Towel 3.16 Bee container 3.17 Hive box Equipment: 3.18 Bee smoker 3.19 Bee blower 3.20 PPE ▪ Bee veil ▪ Bee suit ▪ Masks ▪ Gloves ▪ Boots ▪ Overall coats ▪ Hat ▪ Eye goggles
5. Emergency procedures	5.1 Location of first aid kit 5.2 Evacuation 5.3 Agencies contract 5.4 Farm emergency procedures
6. Hazards	6.1 Chemical 6.2 Electrical 6.3 Falls

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined areas of concern for safety measures 1.2 Applied appropriate safety measures according to industry requirements 1.3 Prepared tools, materials and outfit needed 1.4 Performed proper disposal of used materials 1.5 Cleaned and stored tools, materials and outfit in designated facilities
2. Method of Assessment	**Competency in this unit must be assessed through:** 2.1 Practical demonstration 2.2 Third Party Report
3. Resource Implications	3.1 Farm location 3.2 Tools, equipment and outfits appropriate in applying safety measures
4. Context of Assessment	4.1 Assessment may occur in the workplace or in a simulated workplace or as part of a team under limited supervision

UNIT OF COMPETENCY : **USE FARM TOOLS AND EQUIPMENT**

UNIT CODE : **AFF321208**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use farm tools and equipment. It includes selection, operation and preventive maintenance of farm tools and equipment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select and use farm tools	1.1 Appropriate farm tools are identified according to requirement/use 1.2 Farm tools are checked for faults and defective tools reported in accordance with farm procedures 1.3 Appropriate tools are safely used according to job requirements and manufacturers conditions	1.1 Types and uses of farm tools 1.2 Characteristics of functional tools 1.3 Checking tools for defects/faults 1.4 Segregation and reporting defective tools 1.5 Uses of tools	1.1 Identifying farm tools for the work 1.2 Checking the conditions of tools 1.3 Reporting defective tools 1.4 Using tools
2. Select and operate farm equipment	2.1 Identify appropriate ***tools*** and ***equipment*** 2.2 Instructional manual of the tools and equipment are carefully read prior to operation 2.3 ***Pre-operation check-up*** is conducted in line with manufacturers manual 2.4 Faults in equipment are identified and reported in line with farm procedures 2.5 Farm equipment used according to its function	2.1 Types and operations of farm equipment 2.2 Standards operating procedures of farm equipment 2.3 Instructional manual of equipment 2.4 Pre-operation check-up 2.5 Equipment Specification 2.6 Procedures in calibrating and use of equipment 2.7 Equipment faults identification and reporting	2.1 Identifying appropriate farm equipment for the work 2.2 Reading instructional manual. 2.3 Conducting pre-operation check-up 2.4 Identifying faults/defects of farm equipment 2.5 Reporting on defective farm equipment 2.6 Operating farm equipment 2.7 Following safety procedures.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.6 Safety procedures are followed.	2.8 Operation of equipment 2.9 Codes and Regulations on environmental protection 2.10 Safety and keeping of equipment every after use 2.11 Safety measures	
3. Perform preventive maintenance	3.1 Tools and equipment are cleaned immediately after use in line with farm procedures 3.2 Routine check-up and maintenance are performed 3.3 Tools and equipment are stored in designated areas in line with farm procedures	3.1 Cleaning procedures of tools and equipment 3.2 Maintenance procedures of farm equipment 3.3 Storage of tools and equipment 3.4 Designated storage areas	3.1 Cleaning tools and equipment 3.2 Performing routinely check-up of tools and equipment 3.3 Maintaining farm equipment 3.4 Storing tools and equipment

RANGE OF VARIABLES

VARIABLE	RANGE
1. Farm equipment	May include: 1.1 Engine 1.2 Pumps 1.3 Generators 1.4 Sprayers 1.5 Bee smoker 1.6 PPEs 1.7 Honey extractor 1.8 Pollen drier 1.9 Propolis drier 1.10 Wax melter 1.11 Wax roller 1.12 Dehumidifier 1.13 Convection sealer 1.14 Refractometer 1.15 Induction cooker 1.16 Settling tank with honey gate 1.17 Metal hive stands 1.18 Standard hives with accessories 1.19 Embedding board 1.20 Spur embedder 1.21 Pollen trap 1.22 Propolis trap
2. Farm tools	May include: 2.1 Sickle 2.2 Cutters 2.3 Weighing scales 2.4 Hand tools 2.5 Measuring tools 2.6 Garden tools 2.7 Hive tool 2.8 Bee brush 2.9 Airtight fire proof box 2.10 Uncapping fork and knife 2.11 Frame grip holder 2.12 Bee products harvesting and processing tools
3. Pre-operation check-up	May include: 3.1 Tires 3.2 Brake fluid 3.3 Fuel 3.4 Water 3.5 Oil 3.6 Lubricants 3.7 Battery 3.8 Quantity, availability, and dryness of smoker fuel 3.9 Preheating the smoker

	3.10 Check availability of all tools and equipment needed for bee yard work 3.11 Donning of PPEs

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Correctly identified appropriate farm tools and equipment 1.2 Operated farm equipment according to manual specification 1.3 Performed preventive maintenance
2. Method of Assessment	Competency in this unit must be assessed through: 2.1 Direct observation 2.2 Practical demonstration 2.3 Third Party Report
3. Resource Implications	3.1 Service/operational manual of farm tools and equipment 3.2 Tools and equipment 3.3 Farm implements
4. Context of Assessment	4.1 Assessment may occur in the workplace or in a simulated workplace or as part of a team under limited supervision

UNIT OF COMPETENCY : PERFORM ESTIMATION AND BASIC CALCULATION

UNIT CODE : AFF321203

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform basic workplace calculations.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE
1. Perform estimation	1.1 Job requirements are identified from written or oral communications 1.2 Quantities of materials and resources required to complete a work task are estimated 1.3 The time needed to complete a work activity is estimated 1.4 Accurate estimate for work completion are made 1.5 Estimate of materials and resources are reported to appropriate person	1.1 Job requirements/labor needs 1.2 Calculation of quantities of materials and resources required 1.3 Calculation of time for job completion 1.4 Preparation of estimate report 1.5 Basic mathematical operations 1.6 Percentage and ratios 1.7 Unit Conversion
2. Perform basic workplace calculation	2.1 ***System and units of measurement*** to be followed are ascertained 2.2 Calculation needed to complete work tasks are performed using the ***four basic mathematical operation*** 2.3 Calculate whole fraction, percentage and mixed when are used to complete the instructions 2.4 Number computed is checked following work requirements	2.1 Four basic mathematical operation 2.2 System and units of measurement 2.3 Fraction, percentage and ratio 2.4 Material takeoff 2.5 Materials costing

RANGE OF VARIABLES

VARIABLE	RANGE
1. Four basic mathematical operation	1.1 Addition 1.2 Subtraction 1.3 Multiplication 1.4 Division
2. System of measurement	2.1 English 2.2 Metric
3. Units of measurement	3.1 Area 3.2 Volume 3.3 Weight 3.4 Length

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Performed estimation 1.2 Performed basic workplace calculation 1.3 Applied corrective measures as maybe necessary
2. Method of Assessment	**Competency in this unit must be assessed through:** 2.1 Practical demonstration 2.2 Written examination
3. Resource Implications	3.1 Relevant tools and equipment for basic calculation 3.2 Recommended data
4. Context of Assessment	4.1 Assessment may occur in the workplace or in a simulated workplace or as part of a team under limited supervision

CORE COMPETENCIES

UNIT OF COMPETENCY : ESTABLISH HIVED COLONIES IN A BEE YARD

UNIT CODE : AFF612308

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to acquire, set up and maintain hive and perform work completion. Application of safety measures and practices is required in performing every task.

ELEMENT	PERFORMANCE CRITERIA *Italicized* **terms are elaborated in the Range Statement**	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILL
1. Acquire hive	1.1 ***Species*** of bee are selected according to economic capacity to sustain operation 1.2 Hive is selected according to the species 1.3 Hive and hive stand are purchased according to industry practices 1.4 Sourced out hive is ***checked*** according to required specifications 1.5 Reliable sources of hives are identified according to industry practices	1.1 Species of bee 1.2 Bee biology 1.3 Types of hive 1.4 Designs of hive 1.5 Negotiation process 1.6 Communication 1.7 Mensuration 1.8 Online purchasing 1.9 Out sourcing procedure 1.10 Reliable sources of hive 1.11 Checking for the presence of contaminants 1.12 Standard specification of hive 1.13 Economic capacity to sustain operation	1.1 Identifying species of bee 1.2 Selecting species of bee 1.3 Identifying standard specification of hive 1.4 Selecting hive 1.5 Sourcing out hive 1.6 Checking source of hive 1.7 Identifying reliable sources of hive 1.8 Communication skills 1.9 Negotiation skills 1.10 Mensuration skills 1.11 Computation skills

		1.14 Computation for costing of beekeeping	
2. Setting up hive	2.1 Location is selected according to forage resources and safety 2.2 Tools, materials and equipment are prepared following work requirements and industry procedure 2.3 Tools, materials and equipment are utilized according to work requirements and user's manual 2.4 Starter colony is ***installed*** following industry practice 2.5 Hive stand is installed based on industry practice 2.6 Safety and health measures are applied following OSH and PNS for Code of Good Beekeeping Practices	2.1 Selection of site 2.2 Tools, materials and equipment for setting up hive 2.3 Starter colony 2.4 Installation procedure 2.5 Installation of hive stand 2.6 Safety and health measures - OSH - PNS for Code of Good Beekeeping Practices	2.1 Selecting location 2.2 Identifying tools, materials and equipment 2.3 Identifying starter colony 2.4 Installing starter colony 2.5 Installing hive stand 2.6 Applying safety and health measures

3. Maintain hives	3.1 Hives are inspected following industry practice 3.2 Food is checked following industry practice 3.3 Hives are cleaned according to industry standard 3.4 Disinfection of hives is conducted following industry standard 3.5 Simple repair of hives is conducted following industry practice 3.6 Hives are stored based on accepted practice 3.7 Safety and health measures are applied following OSH and PNS for Code of Good Beekeeping Practices	3.1 Inspection of hives 3.2 Checking of food 3.3 Cleaning procedures 3.4 Disinfection of hives 3.5 Simple repair of hives 3.6 Basic wood working 3.7 Dilapidated hives 3.8 Waste management 3.9 Storage of hive 3.10 Safety practices • OSH • PNS for Code of Good Beekeeping Practices	3.1 Inspecting hives 3.2 Checking food of starter colony 3.3 Cleaning hives 3.4 Conducting disinfection of hives 3.5 Conducting simple repair of hives 3.6 Storing of hive 3.7 Applying safety and health measures
4. Perform work to completion	4.1 Tools and equipment are cleaned and stored following industry practice 4.2 Inventory of tools, materials and equipment is performed following established practice 4.3 Dilapidated hives are discarded according to industry practice 4.4 Wastes are managed following	4.1 Cleaning materials 4.2 Cleaning tools and equipment 4.3 Inventory of tools, materials and equipment 4.4 Inventory procedures 4.5 Record keeping 4.6 Dilapidated hives 4.7 Discarding of dilapidated hives 4.8 Wastes management	4.1 Cleaning tools and equipment 4.2 Conducting inventory of tools, materials and equipment 4.3 Conducting record keeping 4.4 Discarding dilapidated hives 4.5 Managing wastes 4.6 Applying safety and health measures

	environmental rules and regulations 4.5 Safety and health measures are applied following OSH and PNS for Code of Good Beekeeping Practices	4.9 3Rs 4.10 Safety practices ▪ OSH ▪ PNS for Code of Good Beekeeping Practices	

RANGE OF VARIABLES

VARIABLES	RANGE
1. Species of bee	May include: 1.1 *Apis cerana* 1.2 *Apis mellifera* 1.3 *Tetragonula* spp.
2. Checking of hives	May include: 2.1 Checking of contaminants 2.2 Correct specifications in terms of standard hive design
3. Installation of starter colony	May include: 4.1 For *Apis mellifera* – starter colony is transferred to the hive and placed on the hive stand 4.2 For *Tetragonula* spp. and *Apis cerana* – starter colony is placed on the hive stand

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Acquired hive 1.2 Set up hive 1.3 Maintained hives 1.4 Performed work completion 1.5 Applied safety and health measures
2. Resource Implications	**The following resources should be provided**: 2.1 Simulated or actual workplace 2.2 Tools, equipment, materials and supplies needed to demonstrate the required tasks 2.3 References,manuals, and IEC materials 2.4 First aid kit
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Demonstration/ direct observation with oral questioning 3.2 Written exam
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

UNIT OF COMPETENCY : MANAGE BEE COLONY

UNIT CODE : AFF612309

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to control pests and diseases, perform feeding, monitor performance of colony, perform requeening, merge colonies and manage bee swarm. Application of safety and health measures is required in performing every task.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILL
1. Control pests and diseases	1.1 Inspection for pest and diseases is conducted following industry practice 1.2 Regular cleaning and rotation of hive components is performed following industry practice 1.3 ***Tools and materials*** are prepared following industry practice 1.4 ***Tools and materials*** are used according to work requirement and industry practice 1.5 ***Treatment and corrective measures*** are identified and applied following industry practice 1.6 Safety and health measures are applied following OSH and PNS for Code of Good Beekeeping Practices	1.1 Pests and diseases listed in OIE 1.2 Regular cleaning and rotation of hive components 1.3 Treatment and corrective measures 1.4 Safety and health measures ▪ OSH ▪ PNS for Code of Good Beekeeping Practices	1.1 Conducting inspection for pests and diseases 1.2 Performing regular cleaning and rotation of hive components 1.3 Identifying treatment and corrective measures 1.4 Applying safety and health measures

2. Perform feeding	2.1 Number of colonies are identified following industry procedures. 2.2 Type of feed is determined following industry practice 2.3 Amount of feed supplement is computed based on industry practice. 2.4 Feeds are ***prepared*** following industry practice 2.5 Feeding activity is performed depending on the weather conditions 2.6 ***Feeder*** is used following industry practice 2.7 Feeding is monitored following industry practice 2.8 Safety and health measures are applied following OSH and PNS for Code of Good Beekeeping Practices	2.1 Number of colonies 2.2 Amount of feed supplement 2.3 Types of feeding materials 2.4 Preparation of feeds 2.5 Wearing of PPEs 2.6 Mensuration 2.7 Weather conditions 2.8 Feeding activity 2.9 Use of feeder 2.10 Monitoring procedure 2.11 Safety and health measures ▪ Wearing PPEs ▪ OSH ▪ PNS – Code of Good Beekeeping Practices	2.1 Identifying colonies 2.2 Identifying amount of feed supplement 2.3 Selecting of appropriate type of feeding materials to use 2.4 Preparing feeds 2.5 Wearing of PPEs 2.6 Determining weather condition 2.7 Performing feeding activities 2.8 Using feeder 2.9 Monitoring feeding 2.10 Applying safety practices
3. Monitor performance of colony	3.1 Health and perfromance of colony is monitored following industry practice 3.2 Egg laying pattern is monitored according to industry practice 3.3 Food sufficiency is checked according to industry practice 3.4 Corrective measures are identified and	3.1 Importance of health and performance of colony 3.2 Monitoring procedures 3.3 Safety and health measures - Wearing PPEs - OSH - PNS – Code of Good Beekeeping Practices	3.1 Monitoring health and performance of colony 3.2 Monitoring egg laying pattern 3.3 Identifying and applying corrective measures 3.4 Conducting record keeping

	applied following industry procedures 3.5 Record keeping is conducted according to industry practice 3.6 Safety and health measures are applied following OSH and PNS for Code of Good Beekeeping Practices		3.5 Applying safety and health measures
4. Perform requeening	4.1 ***Indicators of requeening*** is checked and identified following industry practice 4.2 Availability of new queen is ensured following industry practice 4.3 Old queen is kept in smaller colony following industry practice 4.4 Old queen is removed from colony according to industry practice 4.5 New queen is marked and introduced to the colony according to industry practice 4.6 Acceptance of colony to the new queen is checked and monitored following industry practice 4.7 Safety practices are applied following OSHS and PNS for Code of Good	4.1 Indicators of requeening 4.2 Process of requeening 4.3 Availability of new queen 4.4 Keeping and transferring old queen 4.5 Removing of queen from colony 4.6 Marking of queens 4.7 Acceptance of colony to the new queen 4.8 Safety and health measures - Wearing PPEs - OSH - PNS – Code of Good Beekeeping Practices	4.1 Checking indicators of requeening 4.2 Ensuring availability of new queen 4.3 Keeping and transferring old queen to smaller colony 4.4 Removing queen from colony 4.5 Marking and introducing new queen to the colony 4.6 Checking acceptance of new queen 4.7 Applying safety and health measures

	Beekeeping Practices		
5. Merge colonies	5.1 ***Indicators for merging colonies*** are identified according to industry practice. 5.2 ***Tools and materials*** are prepared according to work requirements and industry practice 5.3 ***Tools and materials*** used according to work requirements and industry practice 5.4 Brood and bees are taken for merging activities 5.5 Success of merging is confirmed following industry practice 5.6 Safety and health measures are applied following OSHS and PNS for Code of Good Beekeeping Practices	5.1 Indicators for merging colonies 5.2 Process of merging colonies 5.3 Indicators of success of merging the colonies 5.4 Safety and health measures - Wearing of PPEs - OSH - PNS – Code of Good Beekeeping Practices	5.1 Identifying indicators for merging colonies 5.2 Preparing tools and materials for merging 5.3 Taking brood and bees 5.4 Ensuring success of merging 5.5 Applying safety and health measures
6. Manage bee swarming	6.1 ***Indicators of swarming*** are identified according to industry standards. 6.2 ***Control measures*** are identified and applied based on industry standards. 6.3 ***Tools and materials*** are prepared for catching swarm	6.1 Safety and health measures in catching swarm 6.2 Indicators of swarming 6.3 Control Measures 6.4 Application of control measures 6.5 Tools and materials used for controlling and capturing bee swarm	6.1 Identifying indicators of swarming 6.2 Identifying and applying control measures 6.3 Preparing tools and materials for catching bee swarm 6.4 Capturing bee swarm

	following industry practice 6.4 ***Tools and materials*** are used for catching swarm following industry practice 6.5 Bee swarm is ***captured*** according to industry standards. 6.6 Safety practices are applied following OSHS and PNS for Code of Good Beekeeping Practices	6.6 Safety and health measures - Wearing of PPEs - OSH - PNS – Code of Good Beekeeping Practices	6.5 Applying safety and health measures

RANGE OF VARIABLES

RANGE	VARIABLES
1. Tools, materials and equipment	May include: **Tools:** 1.1 Hive tool 1.2 Bee brush **Materials** 1.1 Newspaper sheets 1.2 Hive body 1.3 Queen cage 1.4 Queen catcher 1.5 Feeder **Equipment:** 1.3 Smoker 1.4 PPE • Bee veil • Bee suit • Gloves
2. Treatment and corrective measures	May include: 2.1 Use of miticides 2.2 Use of traps for some pests 2.3 Use of screened bottom board 2.4 Use of shook swarm method
3. Preparation of feeds	May include: 3.1 Types of feeds are identified • pollen • white sugar 3.2 Proportion of mixture is ensured
4. Feeder	May include: 4.1 Top feeder 4.2 Side feeder 4.3 Baggie feeders
5. Indicators of requeening	May include: 5.1 Laying pattern 5.2 Number of eggs laid per day or egg laying capacity 5.3 Presence of supersedure cells
6. Indicators of merging colonies	May include: 6.1 Colony is queenless 6.2 Weak colonies
7. Indicators of swarming	May include: 7.1 Presence of swarm cells 7.2 Presence of numerous drones 7.3 Presence of virgin queen
8. Control measures	May include: 8.1 Expand brood chamber

	8.2 Destroy queen cells or swarm cells 8.3 Kill virgin queen
9. Capture bee swarm	May include: 9.1 Place the two-box hive assembly on the ground, close to the swarm to be captured 9.2 Catch the swarm using a swarm net and shake into the empty bottom chamber 9.3 Put the super with frames and lid back on top of the bottom box 9.4 Capture the bees clustering at their original location and shake them off in front of the entrance 9.5 Capture the queen and place in a queen cage 9.6 Release the queen after 2 days 9.7 Feed the colonies massively

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Controlled pests and disease 1.2 Performed feeding 1.3 Monitored performance of colony 1.4 Performed requeening 1.5 Merged colonies 1.6 Managed bee swarming 1.7 Applied safety and health measures
2. Resource Implications	**The following resources should be provided:** 2.1 Simulated or actual workplace 2.2 Tools, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals 2.4 First aid kit
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Demonstration/ direct observation with oral questioning 3.2 Written exam
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

UNIT OF COMPETENCY : PROPAGATE BEE COLONY

UNIT CODE : AFF612310

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to conduct preparatory activities in propagating colony, assess status and strength of colony, produce colony and maintain newly established colony. Application of safety and health measures is required in performing every task.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILL
1. Conduct preparatory activities	1.1 ***Tools*** and ***materials*** are prepared following industry practice 1.2 PPEs are worn following industry standards and OSHS 1.3 Safety and health measures are applied following OSH and PNS for Code of Good Beekeeping Practices	1.1 Tools and materials 1.2 Wearing of PPEs 1.3 Safety and health measures - OSH - PNS for Code of Good Beekeeping Practices 1.4 Importance on the availability of tools, materials and equipment in the workplace	1.1 Inventorying, selecting and preparing tools, materials and equipment 1.2 Availability of tools, materials and equipment are ensured according to industry practice 1.3 Ensuring availability of tools, materials and equipment 1.4 Wearing of PPEs 1.5 Applying safety practices

2. Assess status and strength of colony	2.1 Indicators of a colony that is about to divide is determined based on industry practice. 2.2 Presence of ***good queen*** is confirmed according to industry standard 2.3 Food is checked following industy standard 2.4 Presence of pests and diseases is checked following industy standard 2.5 Population build up is checked according to industry standard 2.6 Performance of the colony is monitored following industry standard 2.7 Safety and health measures are applied following industry standards	2.1 Hive manipulation 2.2 Safety and health measures - OSH - PNS for Code of Good Beekeeping Practices 2.3 Good quality queen 2.4 Food of the colony - honey and pollen 2.5 Pests and diseases 2.6 Hive compression and expansion 2.7 Population build up 2.8 Performance of the colony	2.1 Ensuring presence of good quality of queen 2.2 Checking food 2.3 Checking presence of pests and diseases 2.4 Checking population build up 2.5 Monitoring performance of colony 2.6 Applying safety practices
3. Produce colony	3.1 Queenless nucs colony is prepared beforehand following industry practice 3.2 Colony is divided according to industry practice 3.3 New queen is acquired following industry practice 3.4 Newly mated queen is introduced to the nucs accocrding to industry practice	3.1 Safety and health measures - OSH and PNS for Code of Good Beekeeping Practices 3.2 Nucleus colony 3.3 Division of colony 3.4 Acquiring new queen 3.5 Introduction of newly mated queen 3.6 Status of food in the colony	3.1 Preparing queenless nucleus colony 3.2 Dividing colony 3.3 Acquiring new queen 3.4 Introducing new queen 3.5 Feeding nucleus colony 3.6 Checking queen acceptance and status

	3.5 Queen acceptance and status of food are checked following industry practice 3.6 Nucleus colony is fed following industry practice 3.7 Safety and health measures are applied following industry standards	3.7 Feeding nucleus colony	3.7 Applying safety practices
4. Maintain newly established colony	4.1 ***Corrective actions*** are applied following industry practice 4.2 ***Treatment*** is applied following industry standard 4.3 Food, health and perfromance of colony is monitored according to industry standard. 4.4 Safety and health measures are applied following industry standards	4.1 Identification of corrective actions 4.2 Application of corrective actions 4.3 Pests and Diseases of Bees 4.4 Treatment of colonies 4.5 Performing treatment to colonies 4.6 Importance of food, health and performance of colony 4.7 Monitoring procedures 4.8 Safety practices - Wearing PPEs - OSH - PNS – Code of Good Beekeeping Practices	4.1 Applying corrective actions 4.2 Applying treatment 4.3 Monitoring food, health and performance 4.4 Applying safety practices

RANGE OF VARIABLES

RANGE	VARIABLES
Tools and materials	Tools and materials may include: **Tools**: 1.1 Bee brush 1.2 Smoker 1.3 Hive tool 1.4 Dissecting set **Materials**: 1.5 Smoker fuel (either of the following: husk, paper, dried leaves, cardboard) 1.6 Matches 1.7 *Apis mellifera hive* (complete set) 1.8 *Apis cerana hive* (complete set) 1.9 *Tetragonula* spp. hive (complete set) 1.10 PPEs - Bee veil - Bee suit - Gloves 1.11 Miticides 1.12 Feeding supplement 1.13 Swarm net – 10 pcs (24”x30”) 1.14 Newspaper sheet (for merging colonies) 1.15 Extra frames 1.16 Nuc box
Good quality of queen	May include: 2.1 Good laying pattern 2.2 Healthy
Corrective actions	May include: 3.1 Adding brood frames from other healthy colonies 3.2 Merging of colonies 3.3 Replacement of queen
Treatment	May include: Diseases: 4.1 Compress colony 4.2 Burn colony 4.3 Re-queen 4.4 Apply shook swarm methods Pests 4.5 Apply miticide 4.6 Put traps for small hive beetle, *Aethina tumida*

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Conducted preparatory activities 1.2 Assessed status and strength of colony 1.3 Produced colony 1.4 Maintained newly established colony 1.5 Applied safety and health measures
2. Resource Implications	**The following resources should be provided:** 2.1 Simulated or actual workplace 2.2 Tools, equipment, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals 2.4 First aid kit
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Demonstration/ direct observation with oral questioning 3.2 Written exam
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

UNIT OF COMPETENCY : CONDUCT HARVESTING OPERATION

UNIT CODE : AFF612311

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to conduct preparatory activities in harvesting, harvest bee products and conduct post-harvest activities. This also include harvesting operation for wild bees. Application of safety measures and practices is required in performing every task.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILL
1. Conduct preparatory activities	1.1 ***Tools, materials and equipment*** are prepared following industry practice 1.2 PPEs are worn following industry standards and OSHS 1.3 Safety and health measures are applied following industry standards	1.1 Tools, materials and equipment for harvesting 1.2 Selection and Inventory procedure 1.3 Importance on the availability of tools, materials and equipment 1.4 Safety and health measures - Wearing of PPEs - OSH - PNS-Code of Good Beekeeping Practices	1.1 Inventorying, selecting and preparing tools, materials and equipment 1.2 Ensuring availability of tools, materials and equipment 1.3 Wearing of PPEs 1.4 Applying safety practices
2. Harvest bee products	2.1 Weather is determined before harvesting bee products 2.2 ***Types of bee products*** to be harvest are identified 2.3 ***Harvesting procedure*** is selected according to the identified bee products 2.4 ***Tools, materials and equipment*** are	2.1 Factors affecting harvesting - Weather condition - Time of harvest 2.2 Types of bee products 2.3 Process of harvesting bee products 2.4 Harvesting bee products 2.5 Application of safety and health measures	2.1 Determining weather condition 2.2 Identifying types of bee products 2.3 Selecting harvesting procedure 2.4 Harvesting bee products 2.5 Applying safety practices

	utilized based on work requirements and user's manual. 2.5 Bee products are harvested according to industry standards 2.6 Safety and health measures are applied following industry standards	- OSH - PNS for Code of Good Beekeeping Practices - Food safety 2.6 Wearing of PPEs	2.6 Wearing PPEs
3. Conduct post – harvest activities	3.1 Harvested bee products are placed in appropriate containers and stored according to industry practice 3.2 Stickies are returned inside the hive in preparation for the next possible harvest 3.3 Harvesting tools and equipment are cleaned and kept in the storage area 3.4 Record keeping is performed following industry practice 3.5 Safety and health measures are applied following industry standards	3.1 Proper storage of harvested bee products 3.2 Appropriate containers for storing 3.3 Importance of stickies 3.4 Placing and returning of stickies 3.5 Cleaning and storing of harvesting tools and equipment 3.6 Record keeping 3.7 Application of safety and health measures - OSH - PNS for Code of Good Beekeeping Practices	3.1 Placing and storing of harvested bee products 3.2 Using of appropriate containers for storing 3.3 Placing and returning stickies inside the hive 3.4 Cleaning and storing harvesting tools and equipment 3.5 Conducting record keeping 3.6 Applying safety practices 3.7 Wearing PPEs

RANGE OF VARIABLES

RANGE	VARIABLES
1. Tools, materials and equipment	May include: **Tools** 1.1 Hive tool 1.2 Smoker 1.3 Uncapping knife 1.4 Knife 1.5 Silicon spatula 1.6 Pitcher 1.7 Strainer 1.8 Pot 1.9 Food grade stainless trays **Materials** 1.10 PPEs: - Bee suit - Bee veil - Gloves **Equipment** 1.11 Settling tank 1.12 Honey extractor 1.13 Propolis trap 1.14 Pollen trap 1.15 Queen excluder
2. Types of bee products	May include: 2.1 Pollen 2.2 Propolis 2.3 Honey 2.4 Beeswax
3. Harvesting procedure	May include: 3.1 *Apis mellifera* • Propolis - using of propolis trap • Honey– scraping of honey comb • Pollen – using of pollen trap • Beeswax – collecting beeswax 3.2 *Apis cerana* • Honey– scraping of honey comb • Pollen – using of pollen trap • Beeswax – collecting beeswax 3.3 *Tetragonula* spp. • Honey pots – dripping of honey pots • Propolis – collection of propolis • Pollen – collection of pollen 3.4 *Apis dorsata*

	• Honey– scraping of honey comb • Pollen – collection of pollen • Beeswax – collecting beeswax 3.5 *Apis breviligula* • Honey - scraping of honey comb • Pollen – collection of pollen • Beeswax – collecting beeswax

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Conducted preparatory activities 1.2 Harvested bee products 1.3 Conducted postharvest activities 1.4 Applied safety and health measures
2. Resource Implications	**The following resources should be provided:** 2.1 Simulated or actual workplace 2.2 Tools, equipment, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals 2.4 First aid kit
3. Methods of Assessment	**Competency in this unit should be assessed through:** 1.1 Demonstration/ direct observation with oral questioning 1.2 Written exam
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

UNIT OF COMPETENCY : PROVIDE POLLINATION SERVICES

UNIT CODE : AFF612312

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to assess pollination service requirement, prepare apiary sites and deliver hives to client, monitor pollination performance of bee colonies and complete pollination services. Application of safety measures and practices is required in performing every task.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILL
1. Confirm pollination service requirement	1.1 Species of bees compatible to the crop to be pollinated is identified according to industry standards. 1.2 Pollination services are confirmed with clients according to industry practice. 1.3 Number, location and types of colonies are determined according to crop requirement. 1.4 ***Factors*** that will affect for pollination services are identified according to industry requirement. 1.5 Strength, condition and health of bee colonies for pollination services are assessed according to industry practice 1.6 Risk to pollination activities posed by environmental condition are	1.1 Period of anthesis and the respective pollinators of the crop 1.2 Pollination services 1.3 Confirmation with clients according to industry practice 1.4 Types of colonies 1.5 Number and location of colonies 1.6 Territory and local government legislatives, regulatory and requirements 1.7 Biosecurity affecting pollination services 1.8 Strength, condition and health of bee colonies 1.9 Risk to pollination activities 1.10 Provision of technical information to clients 1.11 Bee performance and health 1.12 Appropriate certificate and permits for transport of colonies	1.1 Identifying the period of anthesis and the species of bees compatible to the crop to be pollinated 1.2 Confirming pollination services 1.3 Determining number, location and types of colonies 1.4 Identifying factors affecting pollination 1.5 Assessing strength condition and health of bee colonies 1.6 Identifying risk to pollination 1.7 Monitoring risk 1.8 Providing technical information to client

	identified and assessed following industry procedure 1.7 Risk is monitored and reported following industry procedure 1.8 ***Technical information*** is provided to client following workplace procedure		
2. Transport colony for pollination services	2.1 Schedule of pollination services is confirmed with the clients following industry practices. 2.2 Adequate ventilation for hives is provided during transport 2.3 Packaging technique is applied during transport according to industry standard 2.1 Certificates and permits for transport are obtained following industry procedure	2.1 Pollination requirements of different crops 2.2 Preparation for hives to be used for pollination services 2.3 IATA requirements on packaging and air transport of bees 2.4 Packaging technique during transport 2.5 Certificates and permits for transport 2.6 Communication	2.1 Confirming schedule of pollination services 2.2 Providing adequate ventilation during transport 2.3 Applying appropriate packaging technique during transport 2.4 Obtaining certificates and permits for transport

3 Perform pollination services	3.1 Colonies are delivered and set up according to ***industry procedure*** 3.2 Spraying programme is discussed with the clients to minimize damage to bees 3.3 Bee foraging and pollination efficiency is monitored following industry standards 3.4 Care of bees is carried out to ensure apiary perfromance following industry procedure 3.5 Ideal location and number of bee hive is determined for effective pollination	3.1 Existing agricultural practice that are compatible with bee pollination services 3.2 Bee foraging and pollination efficiency 3.3 Monitor bee foraging and pollination efficiency 3.4 Care of bees during pollination 3.5 Communication 3.6 Safety and health measures 3.7 Use of models in the placement and distance between hives	3.1 Delivering and setting up of hives 3.2 Discussing spraying program to client 3.3 Monitoring bee foraging and pollination 3.4 Carrying out care of bees 3.5 Communication skills 3.6 Applying and health measures 3.7 Determining ideal location 3.8 Computing number of bee hives
4 Complete pollination services	4.2 Bee colonies are prepared to be transported back to the bee yard according to industry practice 4.3 Record keeping on pollination services is done following industry procedures 4.4 Improvement on services are recorded for future operation according to workplace requirements. 4.5 Transaction is completed based on the agreed contract.	4.1 Record keeping 4.2 Summarizing record 4.3 Report preparation 4.4 Improvement on services 4.5 Completion of transaction 4.6 Communication skills 4.7 Mathematical skills	4.1 Conducting record keeping 4.2 Recording improvement 4.3 Completing transaction 4.4 Applying communication and mathematical skills

RANGE OF VARIABLES

RANGE	VARIABLES
1. Factors	May include: 1.1 State 1.2 Territory 1.3 Local government legislative 1.4 Regulatory 1.5 Requirements 1.6 Biosecurity
2.Technical information	May include: 2.1 Bee performance 2.2 Health of colony
3. Industry procedure in delivery of hives	May include: 3.1 Workplace procedures 3.2 Legislative requirements 3.3 Biosecurity code of practice

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Confirmed pollination service requirement 1.2 Transported colony for pollination services 1.3 Performed pollination services 1.4 Applied safety and health measures
2. Resource Implications	**The following resources should be provided:** 2.1 Simulated or actual workplace 2.2 Tools, equipment, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals 2.4 First aid kit
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Demonstration/ direct observation with oral questioning 3.2 Written exam
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

SECTION 3 TRAINING ARRANGEMENTS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for **BEEKEEPING NC II.**

They include information on curriculum design; training delivery; trainee entry requirements; tools and equipment; training facilities; and trainer's qualification.

3.1 CURRICULUM DESIGN

TESDA shall provide the training on the development of competency-based curricula to enable training providers develop their own curricula with the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to accompany their curricula.

Course Title: BEEKEEPING **Level:** NC II

Nominal Training Duration:

37 Hours	Basic Competencies
72 Hours	Common Competencies
41 Hours	Core Competencies
150 Hours	
40 Hours	Supervised Industry Learning (SIL)
190 Hours	**Total Hours**

Course Description:

This course is designed to provide the learner with knowledge, practical skills and attitude, applicable in performing work activities involve establishing hived colonies in a bee yard, managing bee colony, propagating bee colony, conducting harvesting operation and provide pollination services.

Upon completion of the course, the learners are expected to demonstrate the above-mentioned competencies to be employed. To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES
37 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

1. Participate in workplace communication	1.1 Obtain and convey workplace information	• Describe Organizational policies
		• Read:
		  ○ Effective communication
		  ○ Written communication
		  ○ Communication procedures and systems
		• Identify:
		  ○ Different modes of communication
		  ○ Medium of communication
		  ○ Flow of communication
		  ○ Available technology relevant to the enterprise and the individual's work responsibilities
		• Prepare different Types of question
		• Gather different sources of information
		• Apply storage system in establishing workplace information
		• Demonstrate Telephone courtesy
			• Group discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written examination
				• Observation
					2 Hours

	1.2 Perform duties following workplace	• Read: ○ Written notices and instructions	• Group discussion • Lecture • Demonstration	• Oral evaluation • Written examination	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	instructions	○ Workplace interactions and procedures • Read instructions on work related forms/documents • Perform workplace duties scenario following workplace instructions		• Observation	

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

	1.3 Complete relevant work related documents	• Describe Communication procedures and systems
		• Read:
		  ○ Meeting protocols
		  ○ Nature of workplace meetings
		  ○ Workplace interactions
		  ○ Barriers of communication
		• Read instructions on work related forms/documents
		• Practice:
		  ○ Estimate, calculate and record routine workplace measures
		  ○ Basic mathematical processes of addition, subtraction, division and multiplication
		• Demonstrate office activities in:
		  ○ workplace meetings and discussions scenario
		• Perform workplace duties scenario following simple written notices
		• Follow simple spoken language
		• Identify the different Non-verbal communication
		• Demonstrate ability to relate to people of social range in the workplace
			• Group discussion
			• Lecture
			• Demonstration
			• Role play
				• Oral evaluation
				• Written examination
				• Observation
					2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Gather and provide information in response to workplace requirements • Complete work related documents			
2. Work in a team environment	2.1 Describe team role and scope	• Discussion on team roles and scope • Participate in the discussion: ○ Definition of Team ○ Difference between team and group	• Lecture/ Discussion • Group Work • Individual Work • Role Play	• Role Play • Case Study • Written Test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		○ Objectives and goals of team • Locate needed information from the different sources of information			
	2.2 Identify one's role and responsibility within team	• Role play: ○ individual role and responsibility • Role Play ○ Understanding Individual differences • Discussion on gender sensitivity	• Role Play • Lecture/ Discussion	• Role Play • Written Test	1 Hour
	2.3 Work as a team member	• Participate in group planning activities • Role play: Communication protocols • Participate in the discussion of standard work procedures and practices	• Group work • Role Play • Lecture/ Discussion	• Role Play • Written Test	1 Hour
3. Solve/address general workplace problems	3.1 Identify routine problems	• Review of the current industry hardware and software products and services • Identify correctly the industry maintenance, service and helpdesk practices, processes and procedures • Make use of the industry standard diagnostic tools • Share best practices in determining basic malfunctions and resolutions to general problems in the workplace • Analyze routine/procedural problems	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	3.2 Look for solutions to routine problems	• Review of the current industry hardware and software products and services • Identify correctly the industry maintenance, service and helpdesk practices, processes and procedures • Make use of the industry standard diagnostic tools • Share best practices in determining basic malfunctions and resolutions to general problems in the workplace • Formulate possible solutions to problems and document procedures for reporting	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
	3.3 Recommend solutions to problems	• Discuss standard operating procedures and documentation processes	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
4. Develop career and life decisions	4.1 Manage one's emotion	• Demonstrate self-management strategies that assist in regulating behavior and achieving personal and learning goals • Explain enablers and barriers in achieving personal and career goals • Identify techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc.	• Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Manage properly one's emotions and recognize situations that cannot be changed and accept them and remain professional • Recall instances that demonstrate self- discipline, working independently and showing initiative to achieve personal and career goals • Share experiences that show confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace			
	4.2 Develop reflective practice	• Enumerate strategies to improve one's attitude in the workplace • Explain Gibbs' Reflective Cycle/Model (Description, Feelings, Evaluation, Analysis, Conclusion, and Action plan) • Use basic SWOT analysis as self-assessment strategy • Develop reflective practice through realization of limitations, likes/ dislikes; through showing of self-confidence • Demonstrate self-acceptance and being able to accept challenges	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • 5 Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour
	4.3 Boost self-confidence and develop self-regulation	• Describe the components of self-regulation based on Self-Regulation Theory (SRT) • Explain personality development concepts	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Cite self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts) • Perform effective communication skills – reading, writing, conversing skills • Show affective skills – flexibility, adaptability, etc. • Determine strengths and weaknesses		• Case problems involving workplace diversity issues	
5. Contribute to workplace innovation	5.1 Identify opportunities to do things better	• Identify different roles of individuals in contributing to doing things better in the workplace • Appreciate positive impacts and challenges in innovation • Show mastery of the different types of changes and levels of participation in the workplace • Discuss 7 habits of highly effective people	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	5.2 Discuss and develop ideas with others	• Identify different roles of individuals in contributing to doing things better in the workplace • Appreciate positive impacts and challenges in innovation • Show mastery of the different types of changes and levels of participation in the workplace • Discuss 7 habits of highly effective people • Communicate ideas through small group discussions and meetings	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	1 Hour
	5.3 Integrate ideas for change in the workplace	• Identify different roles of individuals in contributing to doing things better in the workplace • Appreciate positive impacts and challenges in innovation • Show mastery of the different types of changes and levels of participation in the workplace • Discuss 7 habits of highly effective people	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Communicate ideas through small group discussions and meetings • Demonstrate basic skills in data analysis		• Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	
6. Present relevant information	6.1 Gather data/ information	• Lecture and discussion on: - Organisational protocols - Confidentiality and accuracy - Business mathematics and statistics - Legislation, policy and procedures relating to the conduct of evaluations • Reviewing data/ information	• Group discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written Test • Observation • Presentation	2 Hours
	6.2 Assess gathered data/ information	• Lecture and discussion on: - Data analysis techniques/ procedures - Organisational values, ethics and codes of conduct - Trends and anomalies • Computing business mathematics and statistics • Application of data analysis techniques	• Group discussion • Lecture • Demonstration • Role Play • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	3 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	6.3 Record and present information	• Lecture and discussion on: - Reporting requirements to a range of audiences - Recommendations for possible improvements • Analysis and comparison of interim and final reports' outcomes • Reporting of data findings	• Group discussion • Lecture • Demonstration • Role Play • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	3 Hours
7. Practice occupational safety and health policies and procedures	7.1 Identify OSH compliance requirements	• Discussion regarding: - Hierarchy of Controls - Hazard Prevention and Controls - Work Standards and Procedures - Personal Protective Equipment	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
	7.2 Prepare OSH requirements for compliance	• Identification of required safety materials, tools and equipment • Handling of safety control resources	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
	7.3 Perform tasks in accordance with relevant OSH policies and procedures	• Discussion of General OSH Standards and Principles • Performing industry related work activities in accordance with OSH Standards	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	2 Hours
8. Exercise efficient and effective sustainable	8.1 Identify the efficiency and effectiveness of	- Discussion on the process how Environmental Policies coherence is achieved	• Lecture • Group Discussion • Simulation • Demonstration	• Written Exam • Demonstration • Observation	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
practices in the workplace	resource utilization	• Discussion on Necessary Skills in response to changing environmental policies needs - Waste Skills - Energy Skills - Water Skills - Building Skills - Transport Skills - Material Skills		• Interviews / • Questioning	
	8.2 Determine causes of inefficiency and/or ineffectiveness of resource utilization	• Discussion of Environmental Protection and Resource Efficiency Targets • Analysis on the Relevant Work Procedure	• Lecture • Group Discussion • Demonstration	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
	8.3 Convey inefficient and ineffective environmental practices	• Identification of (re)training needs and usage of environment friendly methods and technologies • Identification of environmental corrective actions • Practicing Environment Awareness	• Lecture • Group Discussion • Role Play • Demonstration	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
9. Practice entrepreneurial skills in the workplace	9.1 Apply entrepreneurial workplace best practices	• Case studies on Best entrepreneurial practices • Discussion on Quality procedures and practices • Case studies on Cost consciousness in resource utilization	• Case Study • Lecture/Discussion	• Case Study • Written Test • Interview	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	9.2 Communicate entrepreneurial workplace best practices	• Discussion on communicating entrepreneurial workplace best practices	• Lecture/Discussion	• Written Test • Interview	1 Hour
	9.3 Implement cost-effective operations	• Case studies on Preservation, optimization and judicious use of workplace resources	• Case Study • Lecture/Discussion	• Case Study • Written Test • Interview	2 Hours

COMMON COMPETENCIES
72 HRS

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
1.Apply safety measures in farm operations	1.1 Determine areas of concern for safety measures	• Identify work tasks in farm operations	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning • Demonstration	(Total-7 hrs) 1 hr
		• Discuss safety measures in a workplace during farm operations	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation • Role playing	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Explain farm operations situations and period when to observe safety	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation • Role playing •	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Identify appropriate tools	• Lecture	• Written	2 hrs
		• materials and outfits to be used	• Discussion • Incomplete worksheet • Power point presentation • Video presentation	• examination • Interview • Oral questioning • Demonstration	

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Prepare tools, materials and outfits for the farm operation	• Lecture • Discussion • Power point presentation • Video presentation • Demonstration •	• Written examination • Interview • Oral questioning • Demonstration	2 hrs
	1.2 Apply appropriate safety measures	• Enumerate uses and functions of tools and materials	• Discussion • Power point presentation • Video presentation • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	(Total -11 hrs.) 1 hr
		• Explain procedures of wearing personal protective equipment	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning •	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet		
		• Discuss topics on effectivity, shelf life and expirations of materials to be used.	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Identify the emergency procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	2 hrs

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Identify hazards in a farm workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning	2 hrs
		• Use tools and materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	2 hrs
		• Wear personal protective equipment	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning	0.5 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet • Demonstration	• Demonstration	
		• Prepare report on hazards in the workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Report on hazards in the workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Role playing	• Written examination • Interview • Oral questioning • Demonstration	0.5 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
	1.3Safekeep/dispose of tools, materials and outfit	• Explain cleaning and storing procedures of the used tools and outfit	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	(Total 6hrs) 1 hr
		• State labelling and storing of unused materials	• Power point presentation • Video presentation • Incomplete worksheet	• examination • Interview • Oral questioning •	1 hr
		• Explain proper wastes disposal	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Clean and store used tools and outfit	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
2.Use farm tools		• Label and store unused materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Dispose waste materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
	2.1 Select and use farm tools and equipment	• Identify farm tools	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	(Total -6 hrs) 1 hr
		• Describe faults and defective tools	• Discussion • Power point presentation	• Written examination • Interview	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Video presentation • Incomplete worksheet • Demonstration	• Oral questioning • Demonstration	
		• Discuss using of tools and equipment relating to manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Check farm tools for faults and defects	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Demonstration • Hands-on		
		• Use tools and equipment relating to manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	2 hrs
	2.2 Select and operate farm equipment	• Identify farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning	(Total -19 hrs) 1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Explain importance of reading manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Discuss pre-operation check and its importance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Identify different types of faults in farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Enumerate reporting procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Role playing	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Enumerate procedures in using farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Discuss safety procedures for farm operation	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning •	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet		
		• Read manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Conduct pre-operation check-up	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Report identified faults	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Operate farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on • Field visit	• Written examination • Interview • Oral questioning • Demonstration	8 hrs

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Follow safety procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
	2.3Perform preventive maintenance	• Enumerate cleaning procedures for tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	(Total -7 hrs) 1 hr
		• Discuss significance of routine check-up and maintenance	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet	• Demonstration	
		• Explain procedures in storing tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Clean tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	2 hrs

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Perform routine check –up and maintenance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Store tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
3.Perform estimation and basic calculation	3.1Perform estimation	• Identify job requirements and work task/activity	• Lecture • Discussion	• Written exam • Oral questioning	(Total -8 hrs) 1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Identify materials and resources of job requirements	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		• Estimate time to complete work task/activity	• Lecture • Discussion • Demonstration • Video presentation	• Written exam • Oral questioning	2 hrs
	3.2 Perform basic workplace calculation	• Estimate quantities of materials and resources	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning	2 hrs
		• Prepare and submit bill of materials	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning • Demonstration	2 hrs
		• Describe different types of calculation	• Lecture • Discussion	• Written exam • Oral questioning	(Total -8 hrs) 1 hr
		• Discuss different methods of calculation	• Lecture • Discussion	• Written exam • Oral questioning	1 hr

CORE COMPETENCIES
41 HOURS

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
1. Establish hived colonies in a bee yard	1.1 Acquire hive	**Knowledge:** Discuss and explain the following: • Species of bee • Bee biology • Types of hive • Designs of hive • Negotiation process • Communication • Mensuration • Online purchasing • Out sourcing procedure • Reliable sources of hive • Checking for the presence of contaminants • Standard specification of hive • Economic capacity to sustain operation **Practical Skill** • Acquire hive	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on Film viewing	• Measure precision and assess quality of acquired hive • Written examination • Practical examination	**(3.5 HRS)** 1hr
	1.2 Setting up hive	**Knowledge** Discuss and explain the following: • Selection of site • Tools, materials and equipment for setting up hive • Starter colony • Installation procedure • Installation of hive stand • Safety and health measures - OSHS	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Measure precision and assess quality of acquired hive • Written examination • Practical examination	1hr

		- PNS for Code of Good Beekeeping Practices **Practical Skill** • Setting up hive			
	1.3 Maintain hives	**Knowledge** Discuss and explain the following: • Inspection of hives • Checking of food • Cleaning procedures • Disinfection of hives • Simple repair of hives • Basic wood working • Dilapidated hives • Waste management • Storage of hive • Safety and health measures - OSHS - PNS for Code of Good Beekeeping Practices **Practical Skill** • Maintain hives	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Practical examination	1hr
	1.4 Perform work completion	**Knowledge** Discuss and explain the following: • Cleaning materials • Cleaning tools and equipment • Inventory of tools, materials and equipment • Inventory procedures • Record keeping • Dilapidated hives • Discarding of dilapidated hives • Wastes management - 3Rs • Safety and health measures - OSHS	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Written examination • Practical examination	0.5hr

		- PNS for Code of Good Beekeeping Practices **Practical Skill** • Perform work completion			
2. Manage bee colony	2.1 Control pests and diseases	**Knowledge** Discuss and explain the following: • Pests and diseases listed in OIE • Regular cleaning and rotation of hive components • Treatment and corrective measures • Safety and health measures - OSH - PNS for Code of Good Beekeeping Practices **Practical Skill** • Control pests and diseases	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Written examination • Practical examination	**(12.5 HRS)** 1hr
	2.2 Perform feeding	**Knowledge** Discuss and explain the following: • Number of colonies • Amount of feed supplement • Types of feeding materials • Preparation of feeds • Wearing of PPEs • Mensuration • Weather conditions • Feeding activity • Use of feeder • Monitoring procedure • Safety and health measures - Wearing PPEs - OSH - PNS – Code of Good Beekeeping Practices **Practical Skill**	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Written examination • Practical examination	0.5hr

		• Perform feeding			
	2.3 Monitor performance of colony	**Knowledge** Discuss and explain the following: • Importance of health and performance of colony • Monitoring procedures • Safety and health measures - Wearing PPEs - OSH - PNS – Code of Good Beekeeping Practices **Practical Skill** • Monitor performance of colony	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Written examination • Practical examination	1hr
	2.4 Perform requeening	**Knowledge** Discuss and explain the following: • Indicators of requeening • Process of requeening • Availability of new queen • Keeping and transferring old queen • Removing of old queen from colony • Marking and introducing of queen to the colony • Acceptance of the new queen by the colony • Safety and health measures - Wearing PPEs - OSH - PNS – Code of Good Beekeeping Practices **Practical Skill** • Perform requeening	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Written examination • Practical examination	4hrs

	2.5 Merge colonies	**Knowledge** Discuss and explain the following: • Indicators for merging colonies • Process of merging colonies • Indicators of success of merging the colonies • Safety and health measures - Wearing of PPEs - OSH - PNS – Code of Good Beekeeping Practices **Practical Skill** • Merge colonies	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Written examination • Practical examination	2hrs
	2.6 Manage bee swarming	**Knowledge** Discuss and explain the following: • Safety and health measures in catching swarm • Indicators of swarming • Control Measures • Application of control measures • Tools and materials used for controlling and capturing bee swarm • Safety and health measures - Wearing of PPEs - OSH - PNS – Code of Good Beekeeping Practices **Practical Skills** • Manage bee swarming	• PowerPoint presentation • Lecture discussion • Demonstration/hands-on • Film viewing	• Written examination • Practical examination	4hrs

3. Propagate bee colony	3.1 Conduct preparatory activities	**Knowledge** Discuss and explain the following: • Tools and materials • Wearing of PPEs • Safety and health measures - OSH - PNS for Code of Good Beekeeping Practices • Importance on the availability of tools, materials and equipment in the workplace **Practical Skill** • Conduct preparatory activities	• PowerPoint presentation • Lecture discussion • Demonstration/ hands-on • Film viewing	• Written examination • Practical examination	**(14 HRS)** 1hr
	3.2 Assess status and strength of of colony	**Knowledge** Discuss and explain the following: • Hive manipulation • Safety and health measures - OSH - PNS for Code of Good Beekeeping Practices • Good quality queen • Food of the colony - Honey and pollen • Pests and diseases • Hive compression and expansion • Population build up • Performance of the colony **Practical Skill** Assess status of colony	• PowerPoint presentation • Lecture discussion • Demonstration/ hands-on • Film viewing	• Written examination • Practical examination	5hr
	3.3 Produce colony	**Knowledge** Discuss and explain the following: • Safety and health measures - OSH and PNS for Code of Good Beekeeping Practices	• PowerPoint presentation • Lecture discussion • Demonstration/ hands-on	• Written examination • Practical examination	4hrs

		• Nucleus colony • Division of colony • Acquiring new queen • Introduction of new queen • Status of food in the colony • Feeding nucleus colony **Practical Skill** Produce colony	• Film viewing		
	4.1 Maintain newly established colony	**Knowledge** Discuss and explain the following: • Identification of corrective actions • Application of corrective actions • Pests and Diseases of Bees • Treatment of colonies • Performing treatment to colonies • Importance of food, health and performance of colony • Monitoring procedures • Safety and health measures - Wearing PPEs - OSHS - PNS – Code of Good Beekeeping Practices **Practical Skill** Maintain colony	• PowerPoint presentation • Lecture discussion • Demonstration/ hands-on • Film viewing	• Written examination • Practical examination	4hrs
4. Conduct harvesting operation	4.2 Conduct preparatory activities	**Knowledge**: Discuss and explain the following: • Tools, materials and equipment for harvesting • Selection and Inventory procedure • Importance on the availability of tools, materials and equipment • Safety and health measures - Wearing of PPEs	• PowerPoint presentation • Lecture discussion • Demonstration /hands-on • Film viewing	• Written examination • Practical examination	**(7 hrs)** 1hr

		- OSH - PNS-Code of Good Beekeeping Practices **Practical Skill** • Conduct preparatory activities			
	4.3 Harvest bee products	**Knowledge** Discuss and explain the following: • Factors affecting harvesting - Weather condition - Time of harvest • Types of bee products • Process of harvesting bee products • Harvesting bee products • Application of safety and measures - OSH - PNS for Code of Good Beekeeping Practices • Wearing of PPEs **Practical Skill** • Harvest bee products	• PowerPoint presentation • Lecture discussion • Demonstration /hands-on • Film viewing	• Written examination • Practical examination	4hrs
	4.4 Conduct post-harvest activities	**Knowledge** Discuss and explain the following: • Proper storage of harvested bee products • Appropriate containers for storing • Importance of stickies • Placing and returning of stickies • Cleaning and storing of harvesting tools and equipment • Record keeping • Application of safety and measures - OSH	• PowerPoint presentation • Lecture discussion • Demonstration /hands-on • Film viewing	• Written examination • Practical examination	2hrs

		- PNS for Code of Good Beekeeping Practices **Practical Skill** • Conduct post –harvest activities			
5. Provide pollination services	5.1 Confirm pollination service requirement	**Knowledge** Discuss and explain the following: • Crops and their respective bee pollinators • Pollination services • Confirmation with clients according to industry practice • Types of colonies • Number and location of colonies • Territory and local government legislatives, regulatory and requirements • Biosecurity affecting pollination services • Strength, condition and health of bee colonies • Risk to pollination activities • Provision of technical information to clients • Bee performance and health • Appropriate certificate and permits for transport of colonies **Skill** • Confirm pollination service requirement	• PowerPoint presentation • Lecture discussion • Demonstration /hands-on • Film viewing	• Written examination • Practical examination	**(4 hrs)** 1hr
	5.2 Transport colony for pollination services	**Knowledge** Discuss and explain the following: • Pollination requirements of different crops • Preparation for hives to be used for pollination services	• PowerPoint presentation • Lecture discussion	• Written examination • Practical examination	1hr

		• IATA requirements on packaging and air transport of bees • Packaging technique during transport • Certificates and permits for transport • Communication **Practical Skill** • Transport colony for pollination services	• Demonstration /hands-on • Film viewing		
	5.1 Perform pollination services	**Knowledge** Discuss and explain the following: • Existing agricultural practice that are compatible with bee pollination services • Bee foraging and pollination efficiency • Monitor bee foraging and pollination efficiency • Care of bees during pollination • Communication • Safety and health measures • Use of models in the placement and distance between hives **Practical Skill** • Perform pollination services	• PowerPoint presentation • Lecture discussion • Demonstration /hands-on • Film viewing	• Written examination • Practical examination	1hr
	5.2 Complete pollination services	**Knowledge** Discuss and explain the following: • Record keeping • Summarizing record • Report preparation • Improvement on services • Completion of transaction • Communication skills • Mathematical skills	• PowerPoint presentation • Lecture discussion • Demonstration /hands-on • Film viewing	• Written examination • Practical examination	1hr

		Practical Skill • Complete pollination Services			

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum. Delivery shall be guided by the principles of competency-based TVET.

    a. Course design is based on competency standards set by the industry or recognized industry sector; (Learning system is driven by competencies written to industry standards)

    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;

    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.

    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;

    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.

    f. Training program allows for recognition of prior learning (RPL) or current competencies;

    g. Training completion is based on satisfactory performance of all specified competencies.

2. The competency-based TVET system recognizes various types of delivery modes, both on-and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities and their variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs:

    2.1 School/Institution- Based:

    - Dual Training System (DTS)/Dualized Training Program (DTP) which contain both in-school and in-industry training or fieldwork components. Details can be referred to the Implementing Rules and Regulations of the DTS Law and the TESDA Guidelines on the DTP;

- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technology that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

- Supervised Industry Training (SIT) or on-the-job training (OJT) is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies as prescribed in the training regulations. It is imperative that the deployment of trainees in the workplace is adhered to training programs agreed by the institution and enterprise and status and progress of trainees are closely monitored by the training institutions to prevent opportunity for work exploitation.

- The classroom-based or in-center instruction uses of learner-centered methods as well as laboratory or field-work components.

2.2 Enterprise-Based:

- Formal Apprenticeship – Training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- Informal Apprenticeship - is based on a training (and working) agreement between an apprentice and a master craftsperson wherein the agreement may be written or oral and the master craftsperson commits to training the apprentice in all the skills relevant to his or her trade over a significant period of time, usually between one and four years, while the apprentice commits to contributing productively to the work of the business. Training is integrated into the production process and apprentices learn by working alongside the experienced craftsperson.

- Enterprise-based Training- where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

2.3 Community-Based

- Short term programs conducted by non- government organizations NGOs, LGUs, training centers and other TVET providers which are intended to address the specific needs of a community. Such programs can be conducted in informal settings such as barangay hall, basketball courts, etc. These programs can also be mobile training program (MTP)

3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students who would like to enroll in this course should possess the following requirements:

- Basic communication skills
- Basic mathematical skills
- Preferably no history of allergic reaction to bee sting, pollen and other products and chemicals used in farming*

*Note: * Medical certificate or waiver must be presented and signed upon enrollment.*

3.4 LIST OF TOOLS, EQUIPMENT AND, MATERIALS

BEEKEEPING NC II

Recommended list of tools, equipment and materials for the training of 20 trainees for Beekeeping NC II.

Up-to-date tools, materials, and equipment of equivalent functions can be used as alternatives. This also applies in consideration of community practices and their availability in the local market.

TOOLS	
QTY	**DESCRIPTION**
20 pcs	Hive tool
20 pcs	Smoker
20 pcs	Hammer
20 packs	Nails
20 spools	Wire
20 pcs	Bee brush
20 pcs	Smoker
20 pcs	Dissecting set
20 pcs	Uncapping knife
20 pcs	Knife
20 pcs	Silicone spatula
20 pcs	Pitcher
20 pcs	Strainer
20 pcs	Pot

EQUIPMENT	
QTY	**DESCRIPTION**
20 pcs	Pen light
20 pcs	Spur embedder
20 pcs	**PPEs**
	Bee veil
	Bee Suit
	Gloves
20pcs (size of pollen trap depends on the species of bees)	Pollen trap
5 pcs (small)	Settling tank
1 unit	Honey extractor
20pcs (standard size)	Propolis trap
20 pcs	Computer/Tablet/Cellular phone

MATERIALS	
QTY	**DESCRIPTION**
20 strong colonies	*Apis mellifera* hive (complete set)
20 strong colonies	*A. cerana* hive (complete set)
20 strong colonies	*Tetragonula* spp. hive (complete set)
20 blocks	Wood for hive construction
20 books	Matches
20 sheets	Wax foundation sheet
5 kg	Smoker fuel (either of the following: husk, paper, dried leaves, cardboard)
5 boxes	Matches
20 pcs	New queen
20 pcs	Nuc boxes
20 pcs	*Extra boxes (used for division of colonies)*
60 pcs	Miticide
20 kg	Feeding Supplement
10 pcs	Swarm net (24”x30”)
20 sheets	Newspaper sheet (used for merging colonies)
5 pcs	Queen cage
5 pcs	Queen catcher
20 pcs	Feeders
10 kg	White sugar
40 pcs (2pcs/trainee)	Extra frames (for foundation)
20 pcs (medium size)	Food grade stainless steel trays

3.5 TRAINING FACILITIES

BEEKEEPING NC II

The size of the beekeeping workshop must be suited on the requirements of the competencies. The class size of 20 students/trainees is reserved for the teaching/ learning and circulation areas as follows:

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
A. **Building (permanent)**			**119.55sq.m.**
• Student/Trainee Working Space	7.00 X 9.00	63.00 sq.m	
• Learning Resource Center	5.10 X 6.00	30.60 sq.m	
• Wash room	1.60 X 1.20	1.92 sq.m	
• Comfort room	male: 2.30 X1.20 female:2.30 X1.80 PWD: 1.60 X1.80	9.78 sq.m	
• Facilities/Equipment/ Circulation Area (30% of teaching accommodation)	1.90 X3.00	5.70 sq.m	
• Store Room	1.90 X4.50	8.55 sq.m	
B. Experimental Bee Yard			**300.00 sq. m.**
TOTAL Area			**419.55 sq.m.**

NOTE: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner- farms/companies. *Open air lecture rooms must be made available to prevent spread of possible infectious agents.*

3.6 TRAINER'S QUALIFICATIONS FOR BEEKEEPING NC II

- Must be a holder of National TVET Trainer Certification (NTTC) of Beekeeping NC II
- Must have at least five (5) years industry experience in Beekeeping within the last seven (7) years
- Must have handled at least one hundred bee colonies

3.7 INSTITUTIONAL ASSESSMENT

Institutional Assessment is gathering of evidences to determine the achievements of the requirements of the qualification to enable the trainer make judgement whether the trainee is competent or not competent.

SECTION 4 ASSESSMENT AND CERTIFICATION ARRANGEMENTS

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to a full qualification or employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

4.1 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1.1 To attain the Qualification of **BEEKEEPING NC II** the candidate must demonstrate competence in all units of competency listed in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.

4.1.2 Assessment shall cover all competencies with basic and common integrated or assessed concurrently with the core units of competency.

4.1.3 Any of the following are qualified to apply for assessment and certification:

4.1.3.1 Graduates of WTR-, NTR-registered programs or formal/non-formal/informal including enterprise-based trainings related to Beekeeping NC II.

4.1.3.2 Experienced workers (wage employed or self-employed) who gained competencies in providing Beekeeping services for at least three (3) years within the last five (5) years.

4.1.4 The guidelines on assessment and certification are discussed in detail in the "Procedures Manual on Assessment and Certification" and "Guidelines on the Implementation of the "Philippine TVET Competency Assessment and Certification System (PTCACS)".

4.2 COMPETENCY ASSESSMENT REQUISITE

4.2.1 **Self-Assessment Guide**. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a) Identify the candidate's skills and knowledge
b) Highlight gaps in candidate's skills and knowledge
c) Provide critical guidance to the assessor and candidate on the evidence that need to be presented

d) Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior to assessment

4.2.2 **Accredited Assessment Center.** Only Assessment Center accredited by TESDA is authorized to conduct competency assessment. Assessment centers undergo a quality assured procedure for accreditation before they are authorized by TESDA to manage the assessment for National Certification.

4.2.3 **Accredited Competency Assessor**. Only accredited competency assessor is authorized to conduct assessment of competence. Competency assessors undergo a quality assured system of accreditation procedure before they are authorized by TESDA to assess the competencies of candidates for National Certification.

COMPETENCY MAP FOR AGRICULTURE, FORESTRY AND FISHERY SECTOR
BEEKEEPING NC II

ANNEX A

BASIC COMPETENCIES

Receive and respond to workplace communication	Participate in workplace communication	Lead workplace communication	Utilize specialized communication skill	Manage and sustain effective communication strategies
Work with others	Work in a team environment	Lead small teams	Develop and lead teams	Manage and sustain high performing teams
Solve/address routine problems	Solve/address general workplace problems	Apply critical thinking and problem solving techniques in the workplace	Perform higher-order thinking processes and apply techniques in the workplace	Evaluate higher order thinking skills and adjust problem solving techniques
Enhance self-management skills	Develop career and life decisions	Work in a diverse environment	Contribute to the practice of social justice in the workplace	Advocate strategic thinking for global citizenship
Support innovation	Contribute to workplace innovation	Propose methods of applying learning and innovation in the organization	Manage innovative work instructions	Incorporate innovation into work procedures
Access and maintain information	Present relevant information	Use information systematically	Manage and evaluate usage of information	Develop systems in managing, and maintaining information
Follow occupational safety and health policies and procedures	Practice occupational safety and health policies and procedures	Evaluate occupational safety and health work practices	Lead in improvement of occupational safety and health program, policies and procedures	Manage implementation of OSH programs in the workplace
Apply environmental work standards	Exercise efficient and effective sustainable practices in the workplace	Evaluate environmental work practices	Lead towards improvement of environmental work programs, policies and procedures	Manage implementation of environmental programs in the workplace
Adopt entrepreneurial mindset in the workplace	Practice entrepreneurial skills in the workplace	Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)	Sustain entrepreneurial skills	Develop and sustain a high-performing enterprise

COMMON COMPETENCIES

Apply safety measures in farm operation	Use farm tools and equipment	Perform estimation and basic calculation	Apply basic first aid	Process farm wastes
Perform record keeping	Maintain service records	Conduct Diagnosis	Perform Shop Maintenance	Provide Quality Customer Service
Comply with Quality and Ethical Standards	Perform mensuration and calculations	Maintain tools and equipment	Apply food safety and sanitation	Prevent and fight fire
Comply with Quality and Ethical Standards	Perform mensuration and calculations	Maintain tools and equipment	Apply food safety and sanitation	Prevent and fight fire
Provide first aid treatment on board	Protect marine environment	Comply with emergency procedures	Apply safety measures in farm and nursery operations	Use farm and nursery tools and equipment
Develop and update industry knowledge				

CORE COMPETENCIES

Restrain and handle animal	Apply bio-security measures	Administer drugs and biologics	Handle and store drugs and biologics	Collect and handle specimen
Establish readiness for artificial insemination	Prepare for artificial insemination (AI) operation	Perform artificial insemination (AI)	Prepare artificial insemination (AI) documentations and reports	Confirm readiness of sow/gilt for artificial insemination
Collect boar semen	Perform artificial insemination (AI) on sow/gilt	Prepare documentations and reports on sow/gilt artificial insemination (AI) activities	Maintain poultry house	Brood and grow chicks
Perform pre-lay and lay activities	Trim beak	Handle breeders	Handle farrowing sows and sucklings	Raise weanlings
Produce finishers	Maintain healthy animal environment	Maintain housing, farm implements and surrounding area	Provide forage	Perform breeding of ruminants
Raise dairy animals	Raise meat-type animals	Establish hived colonies in a bee yard	Manage bee colony	Propagate bee colony
Conduct harvesting operation	Provide pollination services			

GLOSSARY OF TERMS

Aethina tumida	Known as small hive beetle (SHB), a parasitic beetle whose larvae feed on honey, pollen, and brood of weak or dying bee
Anthesis	The flowering period of a plant from the opening of the flower bud
Apiculture	The art and science of keeping honey bees
Apis breviligula	A species of giant honey bee with white and black color; locally known as pukyutan, putyukan, ayukan; usually nesting in forested areas with high elevation in Luzon, Visayas and Mindanao, except Palawan. Produces 40-60 kg of honey per colony per year
Apis cerana	Native species of honey bees; locally known as liguan, laywan, anig; Produces 2-5 kg of honey per colony per year
Apis dorsata	Another species of giant honey bee with black and yellow color; locally known as pukyutan, putyukan, ayukan; usually found in forested areas in Palawan. Produces 40-60 kg of honey per year
Apis mellifera	An introduced honey bee species in the Philippines, commonly used in commercial beekeeping; produces 30 kg of honey per colony per year
Baggie feeders	Any plastic bag holding sugar syrup used for feeding
Bee plants	Variety of flowering plants from which the bees collect the nectar and pollen
Bee pollen	The pollen dislodged from the pollen basket of foraging bees and collected in a pollen trap or removed from the comb
Bee smoker	A device designed to generate smoke from smoldering various fuels blown to the hive to calm the bees
Bee yard	An area of a collection of hives or colonies of bees kept for their products or pollination services
Beehive	A structure in where bees are kept; house of bees
Beekeeper	A person who keeps bees
Beekeeping	The art of keeping bees
Beeswax	Wax secreted from glands on underside of bee abdomen, molded to form honey combs

Brood	Refers to the immature stages of bees such as egg, larva, and pupa that will develop into adult bees
Cappings	The thin layer of new wax that bees build over the ripened honey
Colony	An aggregate of several thousand worker bees, drones and a queen bee living together in a hive or in any other dwelling as one social unit
Comb	A structure manufactured by bees out of beeswax and consisting of hexagon-shaped cells fitted side by side and used by bees to raise brood and store honey and pollen: also called honeycomb
Costing and economic capacity	The financial capacity of each prospective beekeeper
Disease	Means the clinical and/or pathological manifestation of infestation and infection such as American Foul Breed, Chalk Brood, and European Foul Brood
Divide	To split a strong colony into two smaller colonies
Harvesting	The process of removing the honey from the honeycomb
Hive tool	A handheld multipurpose ***tool*** used in separating frames and prying the inner cover of the hive.
Honey	The natural sweet substance produced by bees from the nectar of plants or from secretions of living plants or excretions of plant-sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in the honey comb or in the cerumen pot to ripen and mature
Honey flow	Period when flowers are producing enough nectar to allow significant honey storage
Honey Super	A hive box or hive bodies with frames where honey is stored and ripened
Meliponary	A location where stingless bees colonies are kept
Merging	The act of combining a queenless colony with a queenright colony
Miticide	Substances used to treat mite infestation
Nucleus colony	A smaller hive, sometimes in a smaller box, consisting of bees in all stages of development, their food, a laying queen, and

	enough workers to cover three (3) to five (5) combs; also called nuc or starter colony
Office Internationale de Epizooties (OIE) or World Organization for Animal Health	The inter-governmental organization responsible for improving animal health worldwide
Pollen trap	A device placed at the entrance of the hive to collect pollen carried by the returning foraging bees
Pollination hive	Refers to the *Tetragonula* Pollination Hive (TPH) developed by the UPLB Bee Program
Propolis	Resinous substances collected by bees from plant buds, sap flows, or other botanical sources used by them as sealant for unwanted open spaces in the hive
Propolis trap	A device placed at the top of the hive to collect propolis carried by the returning foraging bees
Queen bee	The fertile fully developed female of a social bee
Queen excluder	A barrier, usually made of plastic or metal sheet with holes that prevents the queen and drones to pass through, only the worker bees do,
Queenless colony	A colony without a queen
Queenright colony	A colony with a laying queen
Ripe Honey	Honey from which bees have evaporated sufficient moisture so that it contains the acceptable moisture content
Shook swarm method	Shaking the bees on to fresh foundation to replace brood combs as a means of reducing diseases
Spur embedder	A tool with concave wheel used to fasten the wax sheet to the wire of the frame
Solar wax melter	A glass covered box that uses the heat of the sun to melt beeswax and to separate it from honey and other materials
Stickies	Frames with drawn comb after honey extraction
Supersedure cell	Cell containing the new queen produced by the workers to replace the failing queen
Swarm	An aggregate of bee colony that leaves the hive to establish a new colony; it is a natural means of reproduction of the bee colonies
Swarm cell	Cell containing the new queen produced by the workers when there is an over abundance of bees in the hive and they need to make a new colony

Tetragonula spp.	Species of stingless bees locally known as lukot, lukutan, libog, tigtig, kiwot, kiyot, duri; can be domesticated in hives and used for honey, pollen and propolis and crop pollination. Produces 1-2 kg of honey per colony per year
Treatment	Refers to disinfection of hive components through cleaning, heating and using of repellant
Wild honey	Honey harvested from wild bee colonies

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