



REPUBLIC OF KENYA

COMPETENCY BASED CURRICULUM

FOR

BEE PRODUCTS PROCESSING AND VALUE ADDITION

LEVEL 3



**TVET CDACC
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FOREWORD

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

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution and this resulted in the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that this curriculum has been developed.

It is my conviction that this curriculum will play a great role towards development of competent human resource for Apiculture Sector's growth and development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING
MINISTRY OF EDUCATION**

PREFACE

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

The Technical and Vocational Education and Training Act No. 29 of 2013 and Sessional Paper No. 4 of 2016 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with Apiculture Sector Skills Advisory Committee (SSAC) have developed this curriculum.

This curriculum has been developed following the CBET framework policy; the CBETA Standards and guidelines provided by the TVET Authority and the Kenya National Qualification framework designed by the Kenya National Qualification Authority.

This curriculum is designed and organized with an outline of learning outcomes; suggested delivery methods, training/learning resources and methods of assessing the trainee’s achievement. The curriculum is competency-based and allows multiple entry and exit to the course.

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

CHAIRPERSON, TVET CDACC

ACKNOWLEDGMENT

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

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

I am convinced that this curriculum will go a long way in ensuring that workers in Apiculture Sector acquire competencies that will enable them to perform their work more efficiently and effectively.

**COUNCIL SECRETARY/CEO
TVET CDACC**

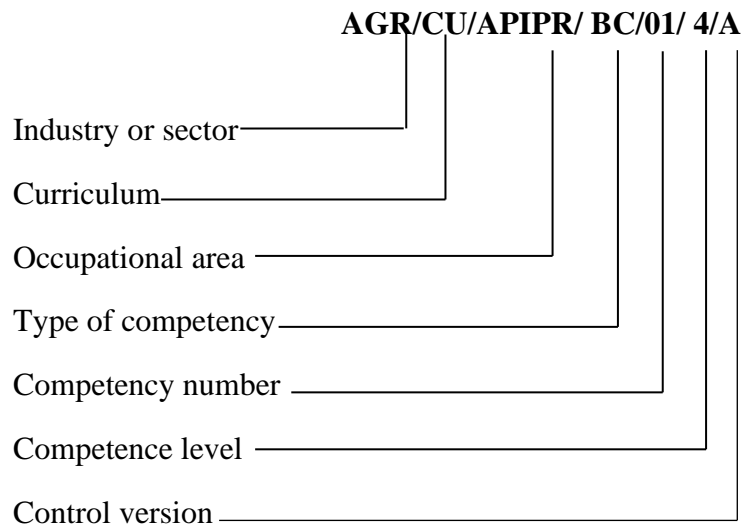
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ABBREVIATIONS AND ACRONYMS

AGR	: Agriculture
APIPR	: Apiculture processing
BC	: Basic Competency
CC	: Core Competency
CDACC	: Curriculum Development Assessment and Certification Council
CO	: Common Units
CU	: Curriculum
KCSE	: Kenya Certificate of Secondary Education
KNQA	: Kenya National Qualifications Authority
OSHA	: Occupation Safety and Health Act
PPE	: Personal Protective Equipment
SSAC	: Sector Skills Advisory Committee
TVET	: Technical and Vocational Education and Training

KEY TO UNIT CODE



COURSE OVERVIEW

Bee products processing Level 4 qualification consists of units of learning that an individual must achieve to harvest bee products, process honey, bees wax, propolis, pollen, and bee venom and process royal jelly. It also enables an individual to process bee brood combs, perform bee product value addition and manage quality of bee products.

The units of learning leading to Bee products processing Level 4 qualification include the following:

Basic Units of Learning

Unit Code	Unit Title	Duration in Hours	Credit factor
AGR/CU/APIPR/BC/01/4/A	Communication skills	20	2
AGR/CU/APIPR/BC/02/4/A	Occupational safety and health practices	25	2.5
AGR/CU/APIPR/BC/03/4/A	Numeracy skills	35	3.5
AGR/CU/APIPR/BC/04/4/A	Digital literacy	60	6
AGR/CU/APIPR/BC/05/4/A	Entrepreneurial skills	30	3
AGR/CU/APIPR/BC/06/4/A	Employability skills	20	2
AGR/CU/APIPR/BC/07/4/A	Environmental literacy	20	2
Total		210	21

Core Units of Learning

Unit of Learning Code	Unit of Learning Title	Duration in Hours	Credit factor
AGR/CU/APIPR/CR/01/4/A	Bee products harvesting	20	2
AGR/CU/APIPR/CR/02/4/A	Honey processing	70	7
AGR/CU/APIPR/CR/03/4/A	Bees wax processing	60	6
AGR/CU/APIPR/CR/04/4/A	Propolis processing	50	5
AGR/CU/APIPR/CR/05/4/A	Pollen processing	40	4
AGR/CU/APIPR/CR/06/4/A	Bee venom processing	30	3
AGR/CU/APIPR/CR/07/4/A	Royal jelly processing	10	1
AGR/CU/APIPR/CR/08/4/A	Brood combs processing	10	1
AGR/CU/APIPR/CR/09/4/A	Bee products value addition	50	5
AGR/CU/APIPR/CR/10/4/A	Bee product quality control	30	3
	Industrial attachment	300	30
Total		670	67

Grand Total		880	88
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The total duration of the course for an average trainee is **880** hours including 300 hours of Industrial Attachment.

Entry Requirements

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

a) Kenya Certificate of Secondary Education (KCSE)

Or

b) Apiculture certificate Level 3

Or

c) Equivalent qualifications as determined by Kenya National Qualifications Authority (KNQA)

Industrial attachment

An individual enrolled in this course will undergo an industrial attachment for a period of 300 hours in apiculture firm dealing with bee product processing.

Trainer qualification

A trainer for this course should have a higher qualification than the level of this course.

Assessment

The course will be assessed at two levels:

- a) **Internal assessment:** conducted continuously by the trainer (internal assessor) who is monitored by an accredited internal verifier.
- b) **External assessment:** conducted by an accredited external assessor who is monitored by an accredited external verifier.

The assessors and verifiers are accredited by TVET CDACC which also coordinates external assessment.

Certification

An individual will be awarded a Certificate of Competency on demonstration of competence in a unit of competency. To be awarded Certificate in Bee products processing Certificate Level 4, an individual must demonstrate competence in all the units of competency.

These certificates will be awarded by TVET CDACC in conjunction with the training provider.

BASIC UNITS OF LEARNING

COMMUNICATION SKILLS

UNIT CODE: AGR/CU/APIPR/BC/01/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Communication Skills

Duration of Unit: 20 Hours

Unit Description

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

Summary of Learning Outcomes

1. Obtain and convey workplace information
2. Complete relevant work-related documents
3. Communicate information about workplace processes
4. Lead workplace discussions
5. Identify and communicate issues arising in the workplace

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Obtain and convey workplace information	<ul style="list-style-type: none">• Communication process• Modes of communication• Medium of communication• Effective communication• Barriers to communication• Flow of communication• Sources of information• Types of questions• Organizational policies• Workplace etiquette• Ethical work practices in handling communication	<ul style="list-style-type: none">• Interview• Third party reports
2. Complete relevant work-related documents	<ul style="list-style-type: none">• Types and purposes of workplace documents and forms• Methods used in filling forms and documents• Recording workplace data	<ul style="list-style-type: none">• Interview• Third party reports

	<ul style="list-style-type: none"> • Process of distributing workplace forms and documents • Report writing • Types of workplace reports 	
3. Communicate information about workplace processes	<ul style="list-style-type: none"> • Communication process • Modes of communication • Medium of communication • Effective communication • Barriers to communication • Flow of communication • Sources of information • Organizational policies • Organization requirements for written and electronic communication methods • Report writing • Effective questioning techniques (clarifying and probing) • Workplace etiquette • Ethical work practices in handling communication 	<ul style="list-style-type: none"> • Interview • Portfolio
4. Lead workplace discussion	<ul style="list-style-type: none"> • Methods of discussion e.g. <ul style="list-style-type: none"> ✓ Coordination meetings ✓ Toolbox discussion ✓ Peer-to-peer discussion • Solicitation of response 	<ul style="list-style-type: none"> • Interview • Third party reports
5. Identify and communicate issues arising in the workplace	<ul style="list-style-type: none"> • Identification of problems and issues • Organizing information on problems and issues • Relating problems and issues • Communication barriers affecting workplace discussions 	<ul style="list-style-type: none"> • Interview • Portfolio

Suggested Methods of Instructions

- Direct instruction
- Demonstration
- Practice assignment
- Discussion
- Role play
- Brainstorming

Recommended Resources

- Desktop computers/laptops
- Internet connection
- Projectors
- Telephone
- Report writing templates

NUMERACY SKILLS

UNIT CODE: AGR/CU/APIPR/BC/02/4/A

Relationship to Occupational Standards:

This unit addresses the Unit of Competency: Demonstrate Numeracy Skills

Duration of Unit: 25 hours

Unit Description

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

Summary of Learning Outcomes

1. Identify and use whole numbers and simple fractions, decimals and percentages for work
2. Identify, measure and estimate familiar quantities for work
3. Read and use familiar maps, plans and diagrams for work
4. Identify and describe common 2D and some 3D shapes for work
5. Construct simple tables and graphs for work using familiar data
6. Identify and interpret information in familiar tables, graphs and charts for work

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify and use whole numbers and simple fractions, decimals and percentages for work	<ul style="list-style-type: none">• Whole numbers• Simple fractions• Decimals• Percentages• Sizes• Problem solving methods• Calculations using the 4 operations• Recording and communicating numerical	<ul style="list-style-type: none">• Written• Practice assignments

	information	
2. Identify, measure and estimate familiar quantities for work	<ul style="list-style-type: none"> • Measurement information • Units of measurement • Estimate familiar and simple amounts • Selection of appropriate measuring equipment • Calculate using familiar units of measurement • Check measurements and results against estimates • Using informal and some formal mathematical and general language • Record or report results 	<ul style="list-style-type: none"> • Written • Practice assignments
3. Read and use familiar maps, plans and diagrams for work	<ul style="list-style-type: none"> • Maps, plans and diagrams • Locate items and places in familiar maps, plans and diagrams • Recognize common symbols and keys in familiar maps, plans and diagrams • Direction and location of objects, or route or places • Use of informal and some formal oral mathematical language and symbols 	<ul style="list-style-type: none"> • Practical test • Written
4. Identify and describe common 2D and some 3D shapes for work	<ul style="list-style-type: none"> • Common 2D shapes and 3D shapes • Classification of common 2D shapes and designs • Description of Use informal and some formal language to describe common two-dimensional shapes and some common three-dimensional shapes • Construction of common 2D shapes • Match common 3D shapes to their 2D sketches or nets 	<ul style="list-style-type: none"> • Written • Practical test

<p>5. Construct simple tables and graphs for work using familiar data</p>	<ul style="list-style-type: none"> • Types of graphs • Determination of data to be collected • Selection of data collection method • Collection of data • Determination of variables from the data collected • Order and collate data • Construct a table and enter data • Construct a graph using data from table • Check results • Report or discuss graph information related to work using informal and some formal mathematical and general language 	<ul style="list-style-type: none"> • Written • Practical test
<p>6. Identify and interpret information in familiar tables, graphs and charts for work</p>	<ul style="list-style-type: none"> • Tables construction and labeling • i.e. title, headings, rows and columns • Interpreting information and data in simple tables • Relaying information of relevant workplace tasks on/in a table • Identify familiar graphs and charts in familiar texts and contexts • Locate title, labels, axes, scale and key from familiar graphs and charts • Identify and interpret information and data in familiar graphs and charts • Relate information to relevant workplace tasks 	<ul style="list-style-type: none"> • Written • Practical test

Suggested Methods of Instructions

- Instructor led facilitation of theory
- Practical demonstration of tasks by trainer

- Practice by trainees/ role play
- Discussion
- Observations and comments and corrections by trainers

Recommended Resources

- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- LCD projectors
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Projectors
- Writing boards
- Mathematical tables

DIGITAL LITERACY

UNIT CODE: AGR/CU/APIPR/BC/03/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Digital Literacy

Duration of Unit: 35 hours

Unit Description

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

Summary of Learning Outcomes

1. Identify computer software and hardware
2. Apply security measures to data, hardware and software
3. Apply computer software in solving tasks
4. Apply internet and email in communication at workplace

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify computer hardware and software	<ul style="list-style-type: none">• Meaning of a computer• Functions of a computer• Components of a computer• Classification of computers	<ul style="list-style-type: none">• Written tests• Oral• Observation
2. Apply security measures to data, hardware and software	<ul style="list-style-type: none">• Data security and control• Security threats and control measures• Types of computer crimes• Detection and protection against computer crimes	<ul style="list-style-type: none">• Written tests• Oral presentation• Observation• Projects
3. Apply computer software in solving tasks	<ul style="list-style-type: none">• Operating system• Word processing• Spread sheets• Data base	<ul style="list-style-type: none">• Oral questioning• Observation• Project
4. Apply internet and email in communication at	<ul style="list-style-type: none">• Computer networks• Uses of internet• Electronic mail (e-mail) concept	<ul style="list-style-type: none">• Oral questioning• Observation• Oral presentation

workplace		<ul style="list-style-type: none">• Written report
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Suggested Methods of Instructions

- Instructor led facilitation of theory
- Demonstration by trainer
- Practical assignment
- Viewing of related videos
- Project
- Group discussions

Recommended Resources

- Desktop computers
- Laptop computers
- Other digital devices
- Printers
- Storage devices
- Internet access
- Computer software

ENTREPRENEURIAL SKILLS

UNIT CODE: AGR/CU/APIPR/BC/04/4/A

Relationship to occupational standards

This unit addresses the Unit of Competency: Demonstrate Entrepreneurial Skills

Duration of unit: 60 hours

Unit description

This unit covers the competencies required for creating and maintaining small scale business, establishing small business customer base, managing and growing a micro/small-scale business.

Summary of Learning Outcomes

1. Create and maintain small scale business
2. Establish small scale business customer base
3. Manage small scale business
4. Grow/expand small scale business

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Create and maintain small scale business	<ul style="list-style-type: none">• Starting a small business• Legal regulatory requirements in starting a small business• SWOT/ PESTEL analysis• Conducting market/industry survey• Generation and evaluation of business ideas• Matching competencies with business opportunities• Forms of business ownership• Location of a small business• Legal and regulatory requirement• Resources required to start	<ul style="list-style-type: none">• Individual/group assignments• projects• Written• Oral

	<p>a small business</p> <ul style="list-style-type: none"> • Common terminologies in entrepreneurship • Entrepreneurship in national development • Self-employment • Formal and informal employment • Entrepreneurial culture • Myths associated with entrepreneurship • Types, characteristics, qualities & role of entrepreneurs • History, development and importance of entrepreneurship • Theories of entrepreneurship • Quality assurance for small businesses • Policies and procedures on occupational safety and health and environmental concerns 	
<p>2. Establish small scale business customer base</p>	<ul style="list-style-type: none"> • Good staff/workers and customer relations • Marketing strategy • Identifying and maintain new customers and markets • Product/ service promotions • Products / services diversification • SWOT / PESTEL analysis • Conducting a business survey • Generating Business ideas • Business opportunities 	<ul style="list-style-type: none"> • Individual/group assignments • projects • Written • Oral

<p>3. Manage small scale business</p>	<ul style="list-style-type: none"> • Organization of a small business • Small business' business plan • Marketing for small businesses • Managing finances for small business • Production/ operation process for goods/services • Small business records management • Book keeping and auditing for small businesses • Business support services • Small business resources mobilization and utilization • Basic business social responsibility • Management of small business • Word processing concepts in small business management • Computer application software • Monitoring and controlling business operations 	<ul style="list-style-type: none"> • Oral • Individual/group assignments • projects • Written
<p>4. Grow/expand small scale business</p>	<ul style="list-style-type: none"> • Methods of growing small business • Resources for growing small business • Small business growth plan • Computer software in business development • ICT and business growth 	<ul style="list-style-type: none"> • Individual/group assignments • projects • Written

Suggested Methods of Instructions

- Instructor led facilitation of theory
- Demonstration by trainer
- Practice by trainee
- Role play

- Case study

Recommended Resources

- Case studies for small businesses
- Business plan templates
- Lap top/ desk top computer
- Internet
- Telephone
- Writing materials

EMPLOYABILITY SKILLS

UNIT CODE: AGR/CU/APIPR/BC/05/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Employability Skills

Duration of Unit: 30 hours

Unit Description

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

Summary of Learning Outcomes

1. Conduct self-management
2. Demonstrate critical safe work habits
3. Demonstrate workplace learning
4. Demonstrate workplace ethics

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Conduct self-management	<ul style="list-style-type: none">• Self-awareness• Formulating personal vision, mission and goals• Strategies for overcoming life challenges• Emotional intelligence• Assertiveness• Expressing personal thoughts, feelings and beliefs• Developing and maintaining high self-esteem• Developing and maintaining positive self-image• Articulating ideas and aspirations• Accountability and responsibility• Good work habits	<ul style="list-style-type: none">• Written tests• Oral questioning• Portfolio of evidence• Third party report

	<ul style="list-style-type: none"> • Self-awareness • Self-development • Financial literacy • Healthy lifestyle practices 	
2. Demonstrate critical safe work habits	<ul style="list-style-type: none"> • Stress and stress management • Punctuality and time consciousness • Interpersonal communication • Sharing information • Leisure • Integrating personal objectives into organizational objectives • Resource's utilization • Setting work priorities • HIV and AIDS • Drug and substance abuse • Handling emerging issues 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Portfolio of evidence • Third party report
3. Demonstrate workplace learning	<ul style="list-style-type: none"> • Personal training needs identification and assessment • Managing own learning • Contributing to the learning community at the workplace • Cultural aspects of work • Variety of learning context • Application of learning • Safe use of technology • Identifying opportunities • Workplace innovation • Performance improvement • Handling emerging issues • Future trends and concerns in learning 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Portfolio of evidence • Third party report
4. Demonstrate workplace ethics	<ul style="list-style-type: none"> • Meaning of ethics • Ethical perspectives • Principles of ethics • Values and beliefs • Ethical standards • Organization code of ethics • Common ethical dilemmas • Organization culture • Corruption, bribery and conflict 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Portfolio of evidence • Third party report

	<p>of interest</p> <ul style="list-style-type: none"> • Privacy and data protection • Diversity, harassment and mutual respect • Financial responsibility/accountability • Etiquette • Personal and professional integrity • Commitment to jurisdictional laws • Emerging issues in ethics 	
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Suggested Methods of Instructions

- Simulation/Role play
- Group Discussion
- Presentations
- Q&A
- Case studies
- Assignments

Recommended Resources

- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- Radio sets
- TV sets
- LCD projectors

ENVIRONMENTAL LITERACY

UNIT CODE: AGR/CU/APIPR/BC/06/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Environmental Literacy

Duration of Unit: 20 hours

Unit Description

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

Summary of Learning Outcomes

1. Control environmental hazard
2. Control environmental pollution
3. Demonstrate sustainable use of resources
4. Evaluate current practices in relation to resource usage

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Control environmental hazard	<ul style="list-style-type: none">• Purposes and content of Environmental Management and Coordination Act 1999• Purposes and content of Solid Waste Act• Storage methods for environmentally hazardous materials• Disposal methods of hazardous wastes• Types and uses of PPE in line with environmental regulations• Occupational Safety and Health Standards (OSHS)	<ul style="list-style-type: none">• Written tests• Oral questions• Observation of work procedures
2. Control environmental Pollution	<ul style="list-style-type: none">• Types of pollution• Environmental pollution control measures• Types of solid wastes	<ul style="list-style-type: none">• Written tests• Oral questions• Observation of work

	<ul style="list-style-type: none"> • Procedures for solid waste management • Different types of noise pollution • Methods for minimizing noise pollution 	<p>procedures</p> <ul style="list-style-type: none"> • Role play
3. Demonstrate sustainable resource use	<ul style="list-style-type: none"> • Types of resources • Techniques in measuring current usage of resources • Calculating current usage of resources • Methods for minimizing wastage • Waste management procedures • Principles of 3Rs (Reduce, Reuse, Recycle) • Methods for economizing or reducing resource consumption 	<ul style="list-style-type: none"> • Written tests • Oral questions • Observation of work procedures
4. Evaluate current practices in relation to resource usage	<ul style="list-style-type: none"> • Collection of information on environmental and resource efficiency systems and procedures, • Measurement and recording of current resource usage • Analysis and recording of current purchasing strategies. • Analysis of current work processes to access information and data • Identification of areas for improvement 	<ul style="list-style-type: none"> • Written tests • Oral questions • Observation of work procedures
5. Identify Environmental legislations/conventions for environmental concerns	<ul style="list-style-type: none"> • Environmental issues/concerns • Environmental legislations /conventions and local ordinances • Industrial standard /environmental practices • International Environmental Protocols (Montreal, Kyoto) • Features of an environmental strategy 	<ul style="list-style-type: none"> • Written tests • Oral questions • Observation of work procedures

Suggested Methods of Instructions

- Instructor led facilitation of theory
- Practical demonstration of tasks by trainer
- Practice by trainees/ role play

- Discussion
- Observations and comments and corrections by trainers

Recommended Resources

- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- Radio sets
- TV sets
- LCD projectors
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE)

OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: AGR/CU/APIPR/BC/07/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Demonstrate Occupational Safety and Health Practices

Duration of Unit: 20 hours

Unit Description

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

Summary of Learning Outcomes

1. Adhere to workplace procedures for hazards and risk prevention
2. Participate in arrangements for workplace safety and health maintenance

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Adhere to workplace procedures for hazards and risk prevention	<ul style="list-style-type: none">• Arrangement of work area and items in accordance with Company housekeeping procedures• Adherence to work standards and procedures• Application of preventive and control measures, including use of safety gears/PPE• Study and apply standards and procedures for incidents and emergencies.	<ul style="list-style-type: none">• Oral questions• Written tests• Portfolio of evidence• Third party report
2. Participate in arrangements for workplace safety and health maintenance	<ul style="list-style-type: none">• Participating in orientations on OSH requirements/regulations of tasks• Providing feedback on health, safety, and security concerns to appropriate personnel as required in a sufficiently detailed manner	<ul style="list-style-type: none">• Oral questions• Written tests• Portfolio of evidence• Third party report

	<ul style="list-style-type: none"> • Practice workplace procedures for reporting hazards, incidents, injuries and sickness • OSH requirements/ regulations and workplace safety and hazard control procedures are reviewed, and compliance reported to appropriate personnel • Identification of needed OSH-related trainings are proposed to appropriate personnel 	
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Suggested Methods of Instructions

- Assignments
- Discussion
- Q&A
- Role play
- Viewing of related videos

Recommended Resources

- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- Radio sets
- TV sets
- LCD projectors
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE) e.g.
 - Mask
 - Face mask/shield
 - Safety boots
 - Safety harness
 - Arm/Hand guard, gloves
 - Eye protection (goggles, shield)
 - Hearing protection (ear muffs, ear plugs)
 - Hair Net/cap/bonnet
 - Hard hat

- Face protection (mask, shield)
- Apron/Gown/coverall/jump suit
- Anti-static suits
- High-visibility reflective vest

CORE UNITS OF LEARNING

BEE PRODUCTS HARVESTING

UNIT CODE: AGR/CU/APIPR/CR/01/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Harvest bee products

Duration of Unit: 20 hours

Unit Description

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

Summary of Learning Outcomes

- 1 Prepare to harvest bee products
- 2 Conduct bee product harvesting
- 3 Extract bee products
- 4 Perform post-harvest practices

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to harvest bee products	<ul style="list-style-type: none">• Meaning of terms honey, propolis, bees wax, royal jelly, bee venom, bee brood, pollen, bee bread• Uses of bee products• Materials, tools and equipment for harvesting bee products• Bee harvest timing and weather conditions• Occupational health and safety procedures in bee products harvesting• Smoker lighting and types of smoker fuel• Protective dressing for bee products harvesting	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
2. Conduct bee product harvesting	<ul style="list-style-type: none">• Procedure for hive opening• Characteristics of ripe honey• Handling honey and brood combs• Honey harvesting techniques• Propolis harvesting techniques	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> • Procedure for harvesting royal jelly • Pollen harvesting techniques 	
3. Extract bee products	<ul style="list-style-type: none"> • Materials and tools for extracting bee products i.e. honey, propolis, bees wax, royal jelly, bee venom, bee brood, pollen • Procedure for extracting bee products i.e. honey, propolis, bees wax, royal jelly, bee venom, bee brood, pollen • Hygienic handling harvested bee products • Occupational health and safety procedures in bee products extraction 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews
4. Perform post-harvest practices	<ul style="list-style-type: none"> • Weighing and grading equipment • Types of bee production records and their preparation • Transportation methods for bee products • Bee products storage equipment and conditions 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Propolis collector
- Pollen trap
- Honey extractor
- Venom collector
- Harvesting containers
- Smokers
- PPE kit
- Bees wax extractor
- Bee brush

- Bee escape
- Food grade storage equipment

HONEY PROCESSING

UNIT CODE: AGR/CU/APIPR/CR/02/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Process honey

Duration of Unit: 70 hours

Unit Description

This unit specifies the competencies required to process honey. It involves preparing materials for processing honey, preparing processing equipment, processing honey and performing post processing procedures.

Summary of Learning Outcomes

- 1 Prepare materials for processing honey
- 2 Prepare processing equipment
- 3 Process honey
- 4 Perform post processing procedures

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare materials for processing honey	<ul style="list-style-type: none">• Identification and assembling materials for processing honey• Sorting materials for processing honey	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
2. Prepare processing equipment	<ul style="list-style-type: none">• Identification of processing equipment• Assembling processing equipment• Setting up the processing equipment• Hygienic and safety measures in preparation of processing equipment	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
3. Process honey	<ul style="list-style-type: none">• Identification of the state, types and form of honey• Characteristics of honey• Methods of honey processing• Characteristics of processing facilities• Procedure for processing honey• Storage requirements/condition for raw and processed honey	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> • Storage equipment for raw and processed honey • Procedure for storing processed honey 	
4. Perform post processing procedures	<ul style="list-style-type: none"> • Identification of packaging materials and equipment • Procurement of packaging materials and equipment • Procedure for packaging processed honey • Branding and labelling of packaging materials • Storage of packaged honey 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Processing facilities
- Refractometer
- Honey
- Packaging materials
- Labels
- Processing equipment
- Honey extractors
- Straining cloth
- Uncapping knives
- Uncapping tray
- Heaters and honey warmers
- PPE
- Settling tanks
- Containers
- Weighing balance

WAX PROCESSING

UNIT CODE: AGR/CU/APIPR/CR/03/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Process bees' wax

Duration of Unit: 60 hours

Unit Description

This unit specifies the competencies required to process beeswax. It involves preparing materials for processing bees wax, preparing processing equipment, processing bees wax and performing post processing procedures.

Summary of Learning Outcomes

- 1 Prepare materials for processing bee's wax
- 2 Prepare processing equipment
- 3 Process bees wax
- 4 Perform post processing procedures

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare materials for processing bees wax	<ul style="list-style-type: none">• Types of combs• Sorting of combs• Assembling raw materials for processing bees wax	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
2. Prepare processing equipment	<ul style="list-style-type: none">• Identification of the processing equipment• Assembling processing equipment• Setting up processing equipment• Safety and hygiene measures in processing	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
3. Process bees wax	<ul style="list-style-type: none">• Selection of the processing method• Procedure for processing bees wax• Settling of bees wax• Storage conditions for processed wax• Storage equipment for processed bees wax• Procedure for storage of bee's wax• Safety and hygiene measures while	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
	storing bees wax	
4. Perform post processing procedures	<ul style="list-style-type: none"> • Management and disposal of wastes 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Packaging material
- Packaging equipment
- Wax straining bag
- Steam wax extractors
- Processing equipment
- Molds
- Storage equipment
- Bar soap
- Source of heat
- Combs

PROPLIS PROCESSING

UNIT CODE: AGR/CU/APIPR/CR/04/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: process propolis

Duration of Unit: 50 hours

Unit Description

This unit specifies the competencies required to process propolis. It involves preparing materials for processing propolis, preparing processing equipment, processing propolis and performing post processing procedures.

Summary of Learning Outcomes

- 1 Prepare materials for processing propolis
- 2 Prepare processing equipment
- 3 Process propolis
- 4 Perform post processing procedures

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare materials for processing propolis	<ul style="list-style-type: none">• Identification of materials for processing propolis• Assembling of materials for processing propolis• Sorting of materials for processing propolis	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
2. Prepare processing equipment	<ul style="list-style-type: none">• Identification of processing methods• Identification of processing equipment• Assembling processing equipment• Setting up processing equipment	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
3. Process propolis	<ul style="list-style-type: none">• Collection of propolis• Cleaning propolis/removal of foreign materials• Processing procedure for propolis• Storage conditions for processed propolis	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> • Storage equipment for propolis • Procedure for storing processed propolis 	
4. Perform post processing procedures	<ul style="list-style-type: none"> • Packaging materials and equipment • Labelling materials and equipment • Management and disposal of waste 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Raw propolis
- Propolis cleaning materials
- Solvents
- Source of heat
- Packaging and labelling materials
- Storage facilities

POLLEN PROCESSING

UNIT CODE: AGR/CU/APIPR/CR/05/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Process pollen

Duration of Unit: 40 hours

Unit Description

This unit specifies the competencies required to process pollen. It involves preparing materials for processing pollen, preparing processing equipment, processing pollen and performing post processing procedures.

Summary of Learning Outcomes

- 1 Prepare materials for processing pollen
- 2 Prepare processing equipment
- 3 Process pollen
- 4 Perform post processing procedures

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare materials for processing pollen	<ul style="list-style-type: none">• Identification of materials for processing pollen• Assembling materials for processing pollen• Sorting materials for processing pollen	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
2. Prepare processing equipment	<ul style="list-style-type: none">• Identification of processing equipment• Assembling of processing equipment• Setting up processing equipment• Safety and hygiene measures in pollen processing	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
3. Process pollen	<ul style="list-style-type: none">• Collection of pollen from pollen traps/combs• Sorting of pollen• Drying conditions for pollen• Storage conditions for pollen• Storage tools and equipment• Storage procedure for pollen	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
4. Perform post processing procedures	<ul style="list-style-type: none"> • Identification of packaging and labelling material and equipment • Sourcing packaging and labelling material and equipment • Procedure for packaging and labelling pollen • Management and disposal of waste 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Pollen
- Pollen trap
- Combs
- Spatulas
- Packaging and labelling materials and equipment
- Sensitive weigh scale/balance

BEE VENOM PROCESSING

UNIT CODE: AGR/CU/APIPR/CR/06/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: process bee venom

Duration of Unit: 30 hours

Unit Description

This unit specifies the competencies required to process bee venom. It involves preparing materials for processing bee venom, preparing processing equipment, processing bee venom and performing post processing procedures.

Summary of Learning Outcomes

- 1 Prepare materials for processing bee venom
- 2 Prepare processing equipment
- 3 Process bee venom
- 4 Perform post processing procedures

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare materials for processing bee venom	<ul style="list-style-type: none">• Meaning of the term bee venom• Properties of bee venom• Composition of bee venom• Uses of bee venom• Uses of anti-venom• Types of anti-venom• Identification of processing materials for processing bee venom• Assembling processing materials for processing bee venom• Sorting processing materials for processing bee venom	<ul style="list-style-type: none">• Written test.• Observation• Third party report• Oral questioning• Interviews
2. Prepare processing equipment	<ul style="list-style-type: none">• Selection of the method of processing• Identification of processing equipment• Assembling of processing equipment• Setting up the processing equipment• Safety and health measures in processing of bee venom	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> • Risk involved in venom processing 	
3. Process bee venom	<ul style="list-style-type: none"> • Safety precautions in bee venom processing • The procedure for processing bee venom • Storage conditions for bee venom • Storage tools and equipment for bee venom • Storage materials for bee venom • Procedure for storing processed bee venom 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews
4. Perform post processing procedures	<ul style="list-style-type: none"> • Packaging and labelling material, equipment for bee venom • Procedure for packaging and labelling processed bee venom • Management and disposal of waste 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Packaging materials
- Source of DC electric current (6MV)
- Venom collector
- Processing equipment
- Strong colony
- PPE
- Storage vials
- Storage equipment
- Cold storage

BEE PRODUCTS VALUE ADDITION

UNIT CODE: AGR/CU/APIPR/CR/07/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Perform bee product value addition

Duration of Unit: 50 hours

Unit Description

This unit specifies the competencies required to perform bee product value addition. It involves preparing the equipment, materials and supplies for value addition, processing wax-based value-added products, processing honey-based value-added products and processing propolis-based value-added products. It also includes processing royal jelly-based value-added products, processing bee venom-based value-added products; packaging and storing value added bee products.

Summary of Learning Outcomes

- 1 Prepare the equipment, materials and supplies for value addition
- 2 Process wax-based value-added products
- 3 Process honey-based value-added products
- 4 Process propolis based value added products
- 5 Royal jelly-based value-added products
- 6 Process bee venom-based value-added products
- 7 Package and store value added bee products

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare the equipment, materials and supplies for value addition	<ul style="list-style-type: none">• Meaning of term value addition.• Identification of bee products for value addition• Equipment's and materials used for value addition• Procedure for setting up equipment's and materials for value addition	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
2. Process wax-based value-added products	<ul style="list-style-type: none">• Types of wax-based value-added products and their uses.(candles, soap, body cream)• Benefits of wax-based value-added products• Methods of preparing wax-based	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
	value-added products <ul style="list-style-type: none"> • Waste disposal 	
3. Process honey-based value-added products	<ul style="list-style-type: none"> • Types of honey-based value-added products (vinegar, honey wine, cough syrup, body cream) • Benefits of honey-based value-added products • Methods of processing honey-based value-added products • Processing waste disposal 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews
4. Process propolis based value added products	<ul style="list-style-type: none"> • Types of propolis based value added products • Benefits of propolis based value added products • Methods of preparing propolis based value added products • Waste disposal 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews
5. Process royal jelly-based value-added products	<ul style="list-style-type: none"> • Types of royal jelly-based value-added products • Benefits of royal jelly-based value-added products • Methods of preparing royal jelly-based value-added products • Waste disposal 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews
6. Process bee venom-based value-added products	<ul style="list-style-type: none"> • Types of bee venom-based value-added products • Benefits of bee venom-based value-added products • Methods of preparing bee venom-based value-added products • Waste disposal 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews
7. Process bee brood value added products	<ul style="list-style-type: none"> • Types of bee brood value added products • Benefits of bee brood value added products • Methods of preparing bee brood value added products • Waste disposal 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Learning Outcome	Content	Suggested Assessment Methods
8. Package and store value added bee products	<ul style="list-style-type: none"> • Types of packaging materials • Proper packaging of value-added products • Branding and labelling • Storage conditions • Storage of tools and equipment 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Bee products
- Packaging equipment
- Honey extractor
- Uncapping knife
- Packaging moulds
- Thermometer
- Processing, straining and settling tanks
- Packaging materials
- Bottles and jars
- Labels
- Weighing scales
- Perfumes
- Buckets
- Medicinal plants
- Vegetable oils
- Hand towels
- Refractometer

BEE PRODUCT QUALITY CONTROL

UNIT CODE: AGR/CU/APIPR/CR/08/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Control quality of bee products

Duration of Unit: 30 hours

Unit Description

This unit specifies the competencies required to control quality of bee products. It involves establishing bee products safety and quality systems, managing quality operations, preparing for raw material and product analyses and carrying out raw material, packaging materials and finished products analyses.

Summary of Learning Outcomes

- 1 Establish bee products safety and quality systems
- 2 Manage quality operations
- 3 Prepare for raw material and product analyses
- 4 Carry out raw material, packaging materials and finished products analyses

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1 Establish bee products safety and quality systems	<ul style="list-style-type: none">• Legal issues related to food handling• Bee products safety and quality systems• Designing and establishing bee product safety and quality systems• Setting up workplace Standard Operating Procedures (SOPs)• Documentation of food quality and safety procedures	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews
2 Participate in quality operations	<ul style="list-style-type: none">• Identification and mobilization of operational resources• Development of work schedules for quality operations• Organization and coordination of quality operations• Staff welfare /personal public health• Phytosanitary measures	<ul style="list-style-type: none">• Written test• Observation• Third party report• Oral questioning• Interviews

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> • Monitoring and evaluation of quality operations • Development of quality/safety management system • Emerging trends in food quality and inspection • Plant maintenance • Integrated pest and rodent management • Laboratory waste management and disposal • Internal quality auditing systems 	
3 Prepare bee product analyses	<ul style="list-style-type: none"> • Bee product analyses tools and equipment • Laboratory code of practice • Development of laboratory standards • Methods of sample collection • Sampling procedures • Development of laboratory standard operating procedures 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews
4 Carry out bee products analyses	<ul style="list-style-type: none"> • Physical and chemical properties of bee product • Types of bee product analysis • Sample preparation • Interpretation and reporting of analyses results • Making decisions based on outcomes and workplace standards • Rejected product disposal 	<ul style="list-style-type: none"> • Written test • Observation • Third party report • Oral questioning • Interviews

Suggested Methods of Instruction

- Projects
- Demonstration by trainer
- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

- Bee products
- Equipment
- Reagents
- Refractometer pipettes
- Standards manual
- Thermometer
- Distiller