



REPUBLIC OF KENYA

COMPETENCY BASED CURRICULUM

FOR

BEE HIVES AND BEE EQUIPMENT CONSTRUCTION

LEVEL 4



**TVET CDACC
P.O. BOX 15745-00100
NAIROBI**

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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 to the formulation of the Policy Framework for Reforming Education and Training. A key feature of this policy is the radical change in the design and delivery of TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

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

It is my conviction that this curriculum will play a great role towards development of competent human resource for the 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) and Ministry of livestock have developed this curriculum.

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.

**Prof. CHARLES M. M. ONDIEKI, PhD, FIET (K), Con. EngTech.
CHAIRMAN, 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.

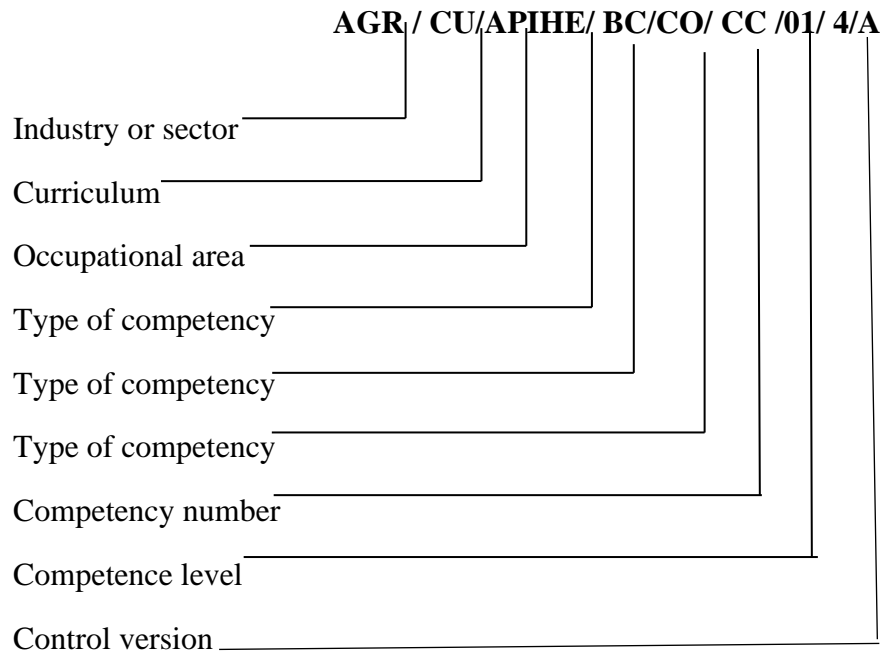
I am convinced that this curriculum will go a long way in ensuring that workers in Apiculture Sector acquire competencies that will enable them to perform their work more efficiently.

Dr. LAWRENCE GUANTAI M'ITONGA, PhD
COUNCIL SECRETARY/CEO
TVET CDACC

ACRONYMS

CDACC	: Curriculum Development Assessment and Certification Council
CU	: Curriculum
BC	: Basic Competency
CC	: Core Competency
CR	: Core unit
CO	: Common Units
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
APIHE	: Apiculture – Hives and Equipment

KEY TO UNIT CODE



COURSE OVERVIEW

The bee hives and bee equipment construction level Four (4) **qualification** consists of competencies that a person must achieve to construct bee hives and bee equipment and fabricate bee hives and bee equipment within the institution's/organizations acceptable standard operating procedures (SOPs).

Units of Learning

This course consists of basic and core units of learning as indicated below:

Basic Units of Learning

Unit of Learning Code	Unit of Learning Title	Duration in Hours	Credit factor
AGR/CU/APIHE/BC/01/4/A	Communication skills	20	2
AGR/CU/APIHE/BC/01/4/A	Occupational safety and health practices	25	2.5
AGR/CU/APIHE/BC/01/4/A	Numeracy skills	35	3.5
AGR/CU/APIHE/BC/01/4/A	Digital literacy	60	6
AGR/CU/APIHE/BC/01/4/A	Entrepreneurial skills	30	3
AGR/CU/APIHE/BC/01/4/A	Employability skills	20	2
AGR/CU/APIHE/BC/01/4/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/APIHE/CR/01/4/A	Construct bee hives and bee equipment	150	15
AGR/CU/APIHE/CR/02/4/A	Fabricate bee hives and bee equipment	100	10
AGR/CU/APIHE/CR/03/4/A	Industrial attachment	300	30
Total		550	55
Grand Total		760	76

The total duration of the course is 760 hours.

Entry Requirements

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

a) Apiculture certificate Level 3

Or

b) Kenya Certificate of Secondary Education (KCSE) E

Or

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

Assessment

The course will be assessed at two levels: internally and externally. Internal assessment is continuous and is conducted by the trainer who is monitored by an accredited internal verifier while external assessment is the responsibility of TVET CDACC.

Certification

A candidate will be issued with a Certificate of competence for each Unit of Competency. To attain the qualification National certificate Level 4 Bee hives and bee equipment construction, the candidate must demonstrate competence in all the units of competency as given in qualification pack. These certificates will be issued by TVET CDACC in conjunction with training provider

BASIC UNITS OF LEARNING

COMMUNICATION SKILLS

UNIT CODE: AGR/CU/APIHE/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 describes the competencies required to lead in the dissemination and discussion of ideas, information and issues in the workplace.

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 discussion
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">• Observation• 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	<ul style="list-style-type: none">• Observation• Interview• Third party reports

	<ul style="list-style-type: none"> • Recording workplace data • 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"> • Observation • 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"> • Observation • 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"> • Observation • Interview • Portfolio

Suggested Delivery Methods

- Discussion
- Role play
- Brainstorming

Recommended Resources

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

NUMERACY SKILLS

UNIT CODE: AGR/CU/APIHE/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 describes the competencies required by a worker in order to competently Identify and use whole numbers and simple fractions, decimals and percentages; Identify, measure and estimate familiar quantities for work, Read and use familiar maps, plans and diagrams for work, Identify and describe common 2D and some 3D shapes for work, Construct simple tables and graphs for work using familiar data, Identify and interpret 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 information	<ul style="list-style-type: none">• Oral• Written• Practical test• Observation

<p>2. Identify, measure and estimate familiar quantities for work</p>	<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"> • Oral • Written • Practical test • Observation
<p>3. Read and use familiar maps, plans and diagrams for work</p>	<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"> • Oral • Written • Practical test • Observation
<p>4. Identify and describe common 2D and some 3D shapes for work</p>	<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 	<ul style="list-style-type: none"> • Oral • Written • Practical test • Observation

	<ul style="list-style-type: none"> • Match common 3D shapes to their 2D sketches or nets 	
5. Construct simple tables and graphs for work using familiar data	<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"> • Oral • Written • Practical test • Observation
6. Identify and interpret information in familiar tables, graphs and charts for work	<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 	<ul style="list-style-type: none"> • Oral • Written • Practical test • Observation

	<ul style="list-style-type: none">• Relate information to relevant workplace tasks	
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Suggested Delivery Methods

- 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

- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Mathematical tables

DIGITAL LITERACY

UNIT CODE:AGR/CU/APIHE/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 effectively demonstrate digital literacy in a working environment. It entails identifying and using digital devices such as smartphones, tablets, laptops and desktop PCs for purposes of communication and performing work related tasks at the work place.

Summary of Learning Outcomes

1. Identify computer hardware and software
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• 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

<p>4. Apply internet and email in communication at workplace</p>	<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 • Written report
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Suggested Delivery Methods

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

Recommended Resources

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

ENTREPRENEURIAL SKILLS

UNIT CODE:AGR/CU/APIHE/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 describes the competencies critical to demonstration of entrepreneurial skills. It includes creating and maintaining small scale business, establishing small scale business customer base, managing and growing a small 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	<ul style="list-style-type: none">• Observation• Case studies• Individual/group assignments• projects• Written• Oral

	<ul style="list-style-type: none"> • Legal and regulatory requirement • Resources required to start a small business • 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 	<ul style="list-style-type: none"> • Observation • Case studies • Individual/group assignments • projects • Written • Oral

	<ul style="list-style-type: none"> • Conducting a business survey • Generating Business ideas • Business opportunities 	
3. Manage small scale business	<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 • Observation • Case studies • Individual/group assignments • projects • Written
4. Grow/expand small scale business	<ul style="list-style-type: none"> • Methods of growing small business 	<ul style="list-style-type: none"> • Observation • Case studies

	<ul style="list-style-type: none"> • 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
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Suggested Delivery Methods

- 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/APIHE/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• Self-awareness• Self-development	<ul style="list-style-type: none">• Observation• Written• Oral interview• Third party report

	<ul style="list-style-type: none"> • 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 • Resources utilization • Setting work priorities • HIV and AIDS • Drug and substance abuse • Handling emerging issues 	<ul style="list-style-type: none"> • Observation • Written • Oral interview • 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"> • Observation • Oral interview • Written • 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 	<ul style="list-style-type: none"> • Observation • Oral interview • Written • Third party report

	<ul style="list-style-type: none"> • Corruption, bribery and conflict of interest • 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 Delivery

- Instructor lead facilitation of theory
- Demonstrations
- Simulation/Role play
- Group Discussion
- Presentations
- Projects
- Case studies
- Assignments

Recommended Resources

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

ENVIRONMENTAL LITERACY

UNIT CODE:AGR/CU/APIHE/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 describes the competencies required to control environmental hazard, control environmental pollution, comply with workplace sustainable resource use and evaluate current practices in relation to resource usage.

Summary of Learning Outcomes

1. Control environmental hazard
2. Control environmental Pollution
3. Demonstrate sustainable resource use
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 questions• Oral questions• Observation of work procedures
2. Control environmental Pollution control	<ul style="list-style-type: none">• Types of pollution	<ul style="list-style-type: none">• Written questions

	<ul style="list-style-type: none"> • Environmental pollution control measures • Types of solid wastes • Procedures for solid waste management • Different types of noise pollution • Methods for minimizing noise pollution 	<ul style="list-style-type: none"> • Oral questions • Observation of work procedures • 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 questions • Oral questions • Observation of work procedures • Role play
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 questions • Oral questions • Observation of work procedures • Role play
5. Identify Environmental legislations/conventions	<ul style="list-style-type: none"> • Environmental issues/concerns 	<ul style="list-style-type: none"> • Written questions

for environmental concerns	<ul style="list-style-type: none"> • 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"> • Oral questions • Observation of work procedures
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Suggested Delivery Methods

- 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

- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Solid Waste Act
- Environmental Management and Coordination Act 1999
- Machine/equipment manufacturer’s specifications and instructions
- Personal Protective Equipment (PPE)

OCCUPATIONAL SAFETY AND HEALTH PRACTICES

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

Relationship to Occupational Standards

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

Duration of Unit: 20 hours

Unit Description

This unit describes the competencies required to practice safety and health and comply with OSH requirements relevant to work.

Summary of Learning Outcomes

1. Observe 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. Observe 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 questions• Observation of work procedures
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	<ul style="list-style-type: none">• Oral questions• Written tests• Practical test• Observation of practical work by trainees

	<p>required in a sufficiently detailed manner</p> <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 Delivery Methods

- 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

- 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 HIVES AND BEE EQUIPMENT CONSTRUCTION

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

Relationship to Occupational Standards

This unit addresses the unit of competency: construct bee hives and bee equipment

Duration of Unit: 110 hours

Unit Description

This unit specifies the competencies required to construct bee hives and bee equipment. It involves preparing to construct bee hives and bee equipment, constructing beehives and bee equipment and completing construction of hives and bee equipment.

Summary of Learning Outcomes

- 1 Prepare to construct bee hives
- 2 Construct Kenya Top Bar Hive
- 3 Construct Langstroth Hive
- 4 Construct catcher box
- 5 Construct observation hive
- 6 Post construction of hives and catcher box

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to construct bee hives	<ul style="list-style-type: none"><input type="checkbox"/> Types of bee hives<input type="checkbox"/> Identification of materials and equipment for construction of bee hives<input type="checkbox"/> Personal protective equipment in bee hive construction	<ul style="list-style-type: none"><input type="checkbox"/> Written test<input type="checkbox"/> Observation<input type="checkbox"/> Third party report<input type="checkbox"/> Oral questioning<input type="checkbox"/> Interviews
2. Construct Kenya Top Bar Hive	<ul style="list-style-type: none"><input type="checkbox"/> Identification of materials and equipment for construction of Kenya Top Bar Hive<input type="checkbox"/> Assembling materials and equipment for construction<input type="checkbox"/> Procedure for seasoning timber<input type="checkbox"/> Procedure for planing timber to the recommended thickness	<ul style="list-style-type: none"><input type="checkbox"/> Written test<input type="checkbox"/> Observation<input type="checkbox"/> Third party report<input type="checkbox"/> Oral questioning<input type="checkbox"/> Interviews

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> <input type="checkbox"/> Components of the Kenya Top Bar Hive <input type="checkbox"/> Procedure for taking measurements for construction of the Kenya Top Bar Hive <input type="checkbox"/> Procedure for cutting timber <input type="checkbox"/> Construction of different hive components <input type="checkbox"/> Drilling bee entrances holes <input type="checkbox"/> Assembling various components <input type="checkbox"/> Fixing Hive hanging wires <input type="checkbox"/> PPE 	
3. Construct Langstroth Hive	<ul style="list-style-type: none"> <input type="checkbox"/> Identification of Materials and equipment for construction of the Langstroth Hive <input type="checkbox"/> Assembling of Materials and equipment for construction of the Langstroth Hive <input type="checkbox"/> Procedure for seasoning timber <input type="checkbox"/> Procedure for planing timber to the recommended thickness <input type="checkbox"/> Components of the Langstroth Hive <input type="checkbox"/> Procedure for taking measurements for construction of the Langstroth Hive <input type="checkbox"/> Procedure for cutting timber <input type="checkbox"/> Construction of different Langstroth hive components <input type="checkbox"/> Making bee entrances <input type="checkbox"/> Assembling various Langstroth Hive components 	<ul style="list-style-type: none"> <input type="checkbox"/> Written test <input type="checkbox"/> Observation <input type="checkbox"/> Third party report <input type="checkbox"/> Oral questioning <input type="checkbox"/> Interviews
4. Construct catcher box	<ul style="list-style-type: none"> <input type="checkbox"/> Types of catcher box(Kenya top bar/langstroth) <input type="checkbox"/> Identification of materials and equipment for construction of the catcher box 	<ul style="list-style-type: none"> <input type="checkbox"/> Written test <input type="checkbox"/> Observation <input type="checkbox"/> Third party report <input type="checkbox"/> Oral questioning

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> <input type="checkbox"/> Assembling materials and equipment for construction of the catcher box <input type="checkbox"/> Procedure for seasoning timber <input type="checkbox"/> Procedure for planing timber to the recommended thickness <input type="checkbox"/> Components of the catcher box <input type="checkbox"/> Procedure for taking measurements for construction of the catcher box <input type="checkbox"/> Procedure for cutting timber <input type="checkbox"/> Construction of different catcher box components <input type="checkbox"/> Drilling bee entrances holes <input type="checkbox"/> Assembling various catcher box components <input type="checkbox"/> Fixing catcher box hanging wires 	<ul style="list-style-type: none"> <input type="checkbox"/> Interviews
5. Construct observation hive	<ul style="list-style-type: none"> <input type="checkbox"/> Identification of Materials and equipment for construction of the observation hive <input type="checkbox"/> Assembling of Materials and equipment for construction of the observation hive <input type="checkbox"/> Procedure for seasoning timber <input type="checkbox"/> Procedure for planing timber to the recommended thickness <input type="checkbox"/> Components of the observation hive <input type="checkbox"/> Procedure for taking measurements for construction of the observation hive <input type="checkbox"/> Procedure for cutting timber <input type="checkbox"/> Construction of different observation hive components <input type="checkbox"/> Making bee entrances/holes <input type="checkbox"/> Assembling various observation hive components 	<ul style="list-style-type: none"> <input type="checkbox"/> Written test <input type="checkbox"/> Observation <input type="checkbox"/> Third party report <input type="checkbox"/> Oral questioning <input type="checkbox"/> Interviews

Learning Outcome	Content	Suggested Assessment Methods
6. Post construction of hives and catcher box	<input type="checkbox"/> Types of baits <input type="checkbox"/> Baiting methods <input type="checkbox"/> Materials for baiting <input type="checkbox"/> Procedure for baiting <input type="checkbox"/> Storage of hives and bee equipment <input type="checkbox"/> Management and disposal of waste	<input type="checkbox"/> Written test <input type="checkbox"/> Observation <input type="checkbox"/> Third party report <input type="checkbox"/> Oral questioning <input type="checkbox"/> Interviews

Suggested Methods of Delivery

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

Recommended Resources

1. Timber
2. Flat metal bar
3. File for sharpening
4. Nails, hammers
5. Wood plainer
6. Joinery equipment
7. Tape measure
8. Iron sheets
9. Galvanized aluminum sheets and wire
10. Drilling machine
11. Pliers
12. Cotton material
13. Goose net
14. Coffee wire
15. Leather/Rexene gloves
16. Sewing machine
17. Tailoring scissors
18. Tin snip
19. Zips and elastic material
20. PPE
21. Baiting material

22. Wood glue
23. Paint
24. Feeder box
25. Queen excluder

BEE EQUIPMENT ACCESSORIES FABRICATION

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

Relationship to Occupational Standards

This unit addresses the unit of competency: Fabricate bee equipment accessories

Duration of Unit: 80 hours

Unit Description

This unit specifies the competencies required to fabricate bee keeping accessories (smoker, hive tool, bee brush, feeder box). It involves preparing to fabricate and fabricating bee equipment accessories.

Summary of Learning Outcomes

- 1 Prepare to fabricate a bee smoker
- 2 Fabricate the smoker
- 3 Fabricate a hive tool
- 4 Construct bee brush
- 5 Conduct post-construction activities and bee equipment

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to fabricate a bee smoker	<ul style="list-style-type: none"><input type="checkbox"/> Identification and assembling of materials and equipment for fabricating a smoker<input type="checkbox"/> Components of a smoker<input type="checkbox"/> Personal protective equipment in fabricating a bee smoker	<ul style="list-style-type: none"><input type="checkbox"/> Written test<input type="checkbox"/> Observation<input type="checkbox"/> Third party report<input type="checkbox"/> Oral questioning<input type="checkbox"/> Interviews
2. Fabricate the smoker	<ul style="list-style-type: none"><input type="checkbox"/> Assembling materials and equipment for fabricating a bee smoker<input type="checkbox"/> Measuring, cutting, shaping and making the nozzle<input type="checkbox"/> Measuring, cutting, shaping and making the barrel<input type="checkbox"/> Fixing the bottom of the barrel and smoothing the edges	<ul style="list-style-type: none"><input type="checkbox"/> Written test<input type="checkbox"/> Observation<input type="checkbox"/> Third party report<input type="checkbox"/> Oral questioning<input type="checkbox"/> Interviews

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> <input type="checkbox"/> Measuring and cutting the material for the smoker pump <input type="checkbox"/> Fixing the pump spring and leather/rexin material <input type="checkbox"/> Assembling the smoker components and fixing the handle <input type="checkbox"/> Smoothing all the sharp/rough edges <input type="checkbox"/> Evaluation of the quality of the bee smoker 	
3. Fabricate a hive tool	<ul style="list-style-type: none"> <input type="checkbox"/> Types of hive tools <input type="checkbox"/> Assembling materials and equipment for making the hive tool <input type="checkbox"/> Measuring and cutting the material to size <input type="checkbox"/> Curving one end <input type="checkbox"/> Sharpening of both ends <input type="checkbox"/> Smoothing and painting <input type="checkbox"/> Evaluation of the quality of the fabricated hive tool 	<ul style="list-style-type: none"> <input type="checkbox"/> Written test <input type="checkbox"/> Observation <input type="checkbox"/> Third party report <input type="checkbox"/> Oral questioning <input type="checkbox"/> Interviews
4. Construct bee brush	<ul style="list-style-type: none"> <input type="checkbox"/> Identification and assembling of materials and equipment for making a bee brush <input type="checkbox"/> Cutting of sisal fibres into the recommended length <input type="checkbox"/> Types of timber to be used in making bee brush handles <input type="checkbox"/> Cutting of timber handle <input type="checkbox"/> Fixing fibres onto the handle <input type="checkbox"/> Trimming sisal fibres to the desired length <input type="checkbox"/> Evaluation of the quality of the bee brush 	<ul style="list-style-type: none"> <input type="checkbox"/> Written test <input type="checkbox"/> Observation <input type="checkbox"/> Third party report <input type="checkbox"/> Oral questioning <input type="checkbox"/> Interviews
5. Conduct post-construction activities and bee equipment	<ul style="list-style-type: none"> <input type="checkbox"/> Storage of fabricated bee hives and bee equipment <input type="checkbox"/> Management and disposal of waste in fabrication 	<ul style="list-style-type: none"> <input type="checkbox"/> Written test <input type="checkbox"/> Observation <input type="checkbox"/> Third party report

Learning Outcome	Content	Suggested Assessment Methods
		<input type="checkbox"/> Oral questioning <input type="checkbox"/> Interviews

Suggested Methods of Delivery

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

Recommended Resources

1. Bee escape
2. Timber
3. Flat metal bar
4. File for sharpening
5. Nails, hammers
6. Wood plainer
7. PPE
8. Joinery equipment
9. Tape measure
10. Iron sheets
11. Galvanized aluminum sheets and wire
12. Drilling machine
13. Pliers
14. Cotton material
15. Goose net
16. Coffee wire
17. Leather/Rexene gloves
18. Sewing machine
19. Tailoring scissors
20. Tin snip
21. Zips and elastic material
22. Smokers
23. Hive tools
24. Honey extractors
25. Bee brush
26. Honey strainers

27. Fiber materials
28. Solar wax extractors
29. Observation hive
30. Honey press
31. Steam wax extractor
32. Pollen trap
33. Catcher box
34. Wood glue