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**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 Agriculture Sector’s growth and development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

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

The Technical and Vocational Education and Training Act No. 29 of 2013 and 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 Agriculture Sector Skills Advisory Committee (SSAC) and Ministry of livestock 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, Agriculture 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.

**COUNCIL SECRETARY/CEO,**

**TVET CDACC**

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ACRONYMS AND ABBREVIATIONS

APIHE Apiculture – Hives and Equipment

BC Basic Competency

CC Core Competency

CDACC Curriculum Development Assessment and Certification Council

CO Common Units

CU Curriculum

CR Core unit

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

**AGR / CU/APIHE/ BC/01/ 4/A**

Industry or sector

Curriculum

Occupational area

Type of competency

Competency number

Competence leveL

Control version

# 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 Code** | **Unit Title** | **Duration in Hours** | **Credit factor** |
| AGR/CU/APIHE/BC/01/4/A | Communication skills | 20 | 2 |
| AGR/CU/APIHE/BC/02/4/A | Occupational safety and health practices | 25 | 2.5 |
| AGR/CU/APIHE/BC/031/4/A | Numeracy skills | 35 | 3.5 |
| AGR/CU/APIHE/BC/04/4/A | Digital literacy | 60 | 6 |
| AGR/CU/APIHE/BC/05/4/A | Entrepreneurial skills | 30 | 3 |
| AGR/CU/APIHE/BC/06/4/A | Employability skills | 20 | 2 |
| AGR/CU/APIHE/BC/07/4/A | Environmental literacy | 20 | 2 |
| **Total** |  | **210** | **21** |

**Core units of learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit 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** |

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**Entry Requirements**

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

1. Apiculture certificate Level 3

**Or**

1. Kenya Certificate of Secondary Education (KCSE) E

**Or**

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

**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: 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 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 | * 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 | * Interview * Third party reports |
| 1. Complete relevant work-related documents | * Types and purposes of workplace documents and forms * Methods used in filling forms and documents * Recording workplace data * Process of distributing workplace forms and documents * Report writing * Types of workplace reports | * Interview * Third party reports |
| 1. Communicate information about workplace processes | * 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 | * Interview * Portfolio |
| 1. Lead workplace discussion | * Methods of discussion e.g.   + Coordination meetings   + Toolbox discussion   + Peer-to-peer discussion * Solicitation of response | * Interview * Third party reports |
| 1. Identify and communicate issues arising in the workplace | * Identification of problems and issues * Organizing information on problems and issues * Relating problems and issues * Communication barriers affecting workplace discussions | * Interview * Portfolio |

**Suggested Methods of Instruction**

* 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/APIHE/BC/02/4/A

**Relationship to Occupational Standards:**

This unit addresses the Unit of Competency: Demonstrate Numeracy Skills

**Duration of Unit:** 25hours

**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 | * Whole numbers * Simple fractions * Decimals * Percentages * Sizes * Problem solving methods * Calculations using the 4 operations * Recording and communicating numerical information | * Written * Practice assignments |
| 2. Identify, measure and estimate familiar quantities for work | * 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 | * Written * Practice assignments |
| 3. Read and use familiar maps, plans and diagrams for work | * 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 | * Practical test * Written |
| 4. Identify and describe common 2D and some 3D shapes for work | * 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 | * Written * Practical test |
| 5. Construct simple tables and graphs for work using familiar data | * 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 | * Written * Practical test |
| 6. Identify and interpret information in familiar tables, graphs and charts for work | * 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 | * Written * Practical test |

**Suggested Methods of Instruction**

* 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**

1. Computers
2. Stationery
3. Charts
4. Video clips
5. Audio tapes
6. 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/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 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 | * Meaning of a computer * Functions of a computer * Components of a computer * Classification of computers | * Written tests * Oral * Observation |
| 1. Apply security measures to data, hardware and software | * Data security and control * Security threats and control measures * Types of computer crimes * Detection and protection against computer crimes | * Written tests * Oral presentation * Observation * Projects |
| 1. Apply computer software in solving tasks | * Operating system * Word processing * Spread sheets * Data base | * Oral questioning * Observation * Project |
| 1. Apply internet and email in communication at workplace | * Computer networks * Uses of internet * Electronic mail (e-mail) concept | * Oral questioning * Observation * Oral presentation * Written report |

**Suggested Methods of Instruction**

1. Instructor led facilitation of theory
2. Demonstration by trainer
3. Practical assignment
4. Viewing of related videos
5. Project
6. Group discussions

**Recommended Resources**

* Desktop 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 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 | * 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 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 | * Individual/group assignments * projects * Written * Oral |
| 1. Establish small scale business customer base | * 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 | * Individual/group assignments * projects * Written * Oral |
| 1. Manage small scale business | * 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 | * Oral * Individual/group assignments * projects * Written |
| 1. Grow/expand small scale business | * Methods of growing small business * Resources for growing small business * Small business growth plan * Computer software in business development * ICT and business growth | * Individual/group assignments * projects * Written |

**Suggested Methods of Instruction**

1. Instructor led facilitation of theory
2. Demonstration by trainer
3. Practice by trainee
4. Role play
5. 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 | 1. Self-awareness 2. Formulating personal vision, mission and goals 3. Strategies for overcoming life challenges 4. Emotional intelligence 5. Assertiveness 6. Expressing personal thoughts, feelings and beliefs 7. Developing and maintaining high self-esteem 8. Developing and maintaining positive self-image 9. Articulating ideas and aspirations 10. Accountability and responsibility 11. Good work habits 12. Self-awareness 13. Self-development 14. Financial literacy 15. Healthy lifestyle practices | 1. Written tests 2. Oral questioning 3. Portfolio of evidence 4. Third party report |
| 1. Demonstrate critical safe work habits | 1. Stress and stress management 2. Punctuality and time consciousness 3. Interpersonal communication 4. Sharing information 5. Leisure 6. Integratingpersonal objectives into organizational objectives 7. Resources utilization 8. Setting work priorities 9. HIV and AIDS 10. Drug and substance abuse 11. Handling emerging issues | 1. Written tests 2. Oral questioning 3. Portfolio of evidence 4. Third party report |
| 1. Demonstrate workplace learning | 1. Personal training needs identification and assessment 2. Managing own learning 3. Contributing to the learning community at the workplace 4. Cultural aspects of work 5. Variety of learning context 6. Application of learning 7. Safe use of technology 8. Identifying opportunities 9. Workplace innovation 10. Performance improvement 11. Handling emerging issues 12. Future trends and concerns in learning | 1. Written tests 2. Oral questioning 3. Portfolio of evidence 4. Third party report |
| 1. Demonstrate workplace ethics | 1. Meaning of ethics 2. Ethical perspectives 3. Principles of ethics 4. Values and beliefs 5. Ethical standards 6. Organization code of ethics 7. Common ethical dilemmas 8. Organization culture 9. Corruption, bribery and conflict of interest 10. Privacy and data protection 11. Diversity, harassment and mutual respect 12. Financial responsibility/accountability 13. Etiquette 14. Personal and professional integrity 15. Commitment to jurisdictional laws 16. Emerging issues in ethics | 1. Written tests 2. Oral questioning 3. Portfolio of evidence 4. Third party report |

**Suggested Methods of Instruction**

1. Simulation/Role play
2. Group Discussion
3. Presentations
4. Q&A
5. Case studies
6. Assignments

**Recommended Resources**

1. Computers
2. Stationery
3. Charts
4. Video clips
5. Audio tapes
6. Radio sets
7. TV sets
8. 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:** 20hours

**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 | * 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) | * Written tests * Oral questions * Observation of work procedures |
| 1. Control environmental Pollution | * Types of pollution * Environmental pollution control measures * Types of solid wastes * Procedures for solid waste management * Different types of noise pollution * Methods for minimizing noise pollution | * Written tests * Oral questions * Observation of work procedures * Role play |
| 1. Demonstrate sustainable resource use | * 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 | * Written tests * Oral questions * Observation of work procedures |
| 1. Evaluate current practices in relation to resource usage | * 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 | * Written tests * Oral questions * Observation of work procedures |
| 1. Identify Environmental legislations/conventions for environmental concerns | * Environmental issues/concerns * Environmental legislations /conventions and local ordinances * Industrial standard /environmental practices * International Environmental Protocols (Montreal, Kyoto) * Features of an environmental strategy | * Written tests * Oral questions * Observation of work procedures |

**Suggested Methods of Instruction**

* 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**

1. Computers
2. Stationery
3. Charts
4. Video clips
5. Audio tapes
6. Radio sets
7. TV sets
8. 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/APIHE/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 | * 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. | * Oral questions * Written tests * Portfolio of evidence * Third party report |
| 1. Participate in arrangements for workplace safety and health maintenance | * 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 * 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 | * Oral questions * Written tests * Portfolio of evidence * Third party report |

**Suggested Methods of Instruction**

* Assigments
* Discussion
* Q&A
* Role play
* Viewing of related videos

**Recommended Resources**

1. Computers
2. Stationery
3. Charts
4. Video clips
5. Audio tapes
6. Radio sets
7. TV sets
8. 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 bootsn
* 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:** 110hours

**Unit Description**

This unit specifies the competencies required to construct bee hives. It involves preparing to construct bee hives, constructing Kenya Top Bar Hive, Langstroth Hive, catcher box, observation hive and post construction of hives and catcher box and observation hives

**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** | **Methods of assessment** |
| --- | --- | --- |
| 1. Prepare to construct bee hives | * Types of bee hives * Identification of materials and equipment for constructionof bee hives * Personal protective equipment in bee hive construction | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Construct Kenya Top Bar Hive | * + Identification of materials and equipment for construction of Kenya Top Bar Hive   + Assembling materials and equipment for construction   + Procedure for seasoning timber   + Procedure for plaining timber to the recommended thickness   + Components of the Kenya Top Bar Hive   + Procedure for taking measurements for construction of the Kenya Top Bar Hive   + Procedure for cutting timber   + Construction of different hive components   + Drilling bee entrances holes   + Assembling various components   + Fixing Hive hanging wires   + PPE | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Construct Langstroth Hive | * + Identification of Materials and equipment for construction of the Langstroth Hive   + Assembling of Materials and equipment for construction of the Langstroth Hive   + Procedure for seasoning timber   + Procedure for plaining timber to the recommended thickness   + Components of the Langstroth Hive   + Procedure for taking measurements for construction of the Langstroth Hive   + Procedure for cutting timber   + Construction of different Langstroth hive components   + Making bee entrances   + Assembling various Langstroth Hive components | * + Written test   + Observation   + Third party report   + Oral questioning   + Interviews |
| 1. Construct catcher box | * Types of catcher box(Kenya top bar/langstroth) * Identification of materials and equipment for construction of the catcher box * Assembling materials and equipment for construction of the catcher box * Procedure for seasoning timber * Procedure for plaining timber to the recommended thickness * Components of the catcher box * Procedure for taking measurements for construction of the catcher box * Procedure for cutting timber * Construction of different catcher box components * Drilling bee entrances holes * Assembling various catcher box components * Fixing catcher box hanging wires | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Construct observation hive | * Identification of Materials and equipment for construction of the observation hive * Assembling of Materials and equipment for construction of the observation hive * Procedure for seasoning timber * Procedure for plaining timber to the recommended thickness * Components of the observation hive * Procedure for taking measurements for construction of the observation hive * Procedure for cutting timber * Construction of different observation hive components * Making bee entrances/holes * Assembling various observation hive components | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Post construction of hives and catcher box | * Types of baits * Baiting methods * Materials for baiting * Procedure for baiting * Storage of hives and bee equipment * Management and disposal of waste | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of instructions**

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

**Recommended Resources**

* Timber
* Flat metal bar
* File for sharpening
* Nails, hammers
* Wood plainer
* Joinery equipment
* Tape measure
* Iron sheets
* Galvanized aluminum sheets and wire
* Drilling machine
* Pliers
* Cotton material
* Goose net
* Coffee wire
* Leather/Rexene gloves
* Sewing machine
* Tailoring scissors
* Tin snip
* Zips and elastic material
* PPE
* Baiting material
* Wood glue
* Paint
* Feeder box
* 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 equipment accessories (smoker, hive tool, bee brush, feeder box). It involves preparing to fabricate a bee smoker, fabricating the smoker, a hive tool, constructing bee brush and conducting post-construction activities and bee equipment

**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** | **Methods of assessment** |
| --- | --- | --- |
| 1. Prepare to fabricate a bee smoker | * Identification and assembling of materials and equipment for fabricating a smoker * Components of a smoker * Personal protective equipment in fabricating a bee smoker | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Fabricate the smoker | * + Assembling materials and equipment for fabricating a bee smoker   + Measuring, cutting, shaping and making the nozzle   + Measuring, cutting, shaping and making the barrel   + Fixing the bottom of the barrel and smoothening the edges   + Measuring and cutting the material for the smoker pump   + Fixing the pump spring and leather/rexin material   + Assembling the smoker components and fixing the handle   + Smoothening all the sharp/rough edges   + Evaluation of the quality of the bee smoker | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Fabricate a hive tool | * + Types of hive tools   + Assembling materials and equipment for making the hive tool   + Measuring and cutting the material to size   + Curving one end   + Sharpening of both ends   + Smoothening and painting   + Evaluation of the quality of the fabricated hive tool | * + Written test   + Observation   + Third party report   + Oral questioning   + Interviews |
| 1. Construct bee brush | * Identification and assembling of materials and equipment for making a bee brush * Cutting of sisal fibres into the recommended length * Types of timber to be used in making bee brush handles * Cutting of timber handle * Fixing fibres onto the handle * Trimming sisal fibres to the desired length * Evaluation of the quality of the bee brush | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Conduct post-construction activities and bee equipment | * Storage of fabricated bee hives and bee equipment * Management and disposal of waste in fabrication | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of instructions**

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

**Recommended Resources**

* Bee escape
* Timber
* Flat metal bar
* File for sharpening
* Nails, hammers
* Wood plainer
* PPE
* Joinery equipment
* Tape measure
* Iron sheets
* Galvanized aluminum sheets and wire
* Drilling machine
* Pliers
* Cotton material
* Goose net
* Coffee wire
* Leather/Rexene gloves
* Sewing machine
* Tailoring scissors
* Tin snip
* Zips and elastic material
* Smokers
* Hive tools
* Honey extractors
* Bee brush
* Honey strainers
* Fiber materials
* Solar wax extractors
* Observation hive
* Honey press
* Steam wax extractor
* Pollen trap
* Catcher box
* Wood glue