

**REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

**HORTICULTURAL PRODUCE PROCESSING**

**LEVEL 5**



TVET CDACC

P.O. BOX 15745-00100

NAIROBI

First published 2019

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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 (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of the 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 sustainable 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 in order 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 Horticulture Sector Skills Advisory Committee (SSAC), German International Cooperation and Ministry of Agriculture, Livestock and Fisheries have developed this curriculum. TVET CDACC in conjunction with Micro Enterprises Support Programme Trust (MESPT) have reviewed this curriculum and incorporated Food Safety.

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, Horticulture SSAC expert workers and all those who participated in the development and review of these occupational standards.

**CHAIRMAN**

**TVET CDACC**

# ACKNOWLEDGEMENT

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 appreciate NEPAD Planning and Coordinating Agency (NPCA) of the Africa Union Commission and German Ministry of Economic Cooperation and Development (BMZ) through its implementing agency German International Cooperation (GIZ) GmbH which enabled the development of this curriculum through the CAADP ATVET project. I also appreciate the office of the National Coordinator of GIZ CAADP ATVET Project which was instrumental in the cooperation between the project team, Ministry of Agriculture, Livestock and Fisheries (MoALF) and Ministry of Education.

Much gratitude goes to Micro Enterprises Support Program Trust (MESPT) who initiated the review process and the incorporation of Food Safety in the Curriculum. I acknowledge the Danish International Development Agency (DANIDA) and the European Union (EU) who sponsored the review process.

I recognize with appreciation the role of Horticulture Sector Skills Advisory Committee (SSAC) members for their contribution to the development of this curriculum. I also thank all stakeholders in the Agriculture 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 Horticulture processing acquire competencies that will enable them to perform their work more efficiently.

**COUNCIL SECRETARY/CEO**

**TVET CDACC**

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# ABBREVIATION AND ACRONYMNS

ATVET : Agricultural Technical and Vocational Education and Training

CAADP : Comprehensive Africa Agricultural Development Programme

CBET : Competency Based Education and Training

CDACC : Curriculum Development Assessment and Certification Council

CUR : Curriculum

DACUM : Develop a Curriculum

DANIDA Danish International Development Agency

EMCA : Environmental Management and Conservation Act

GAP : Good Agricultural Practices

GDP : Gross Domestic Product

GMOs : Genetically Modified Organisms

HCDA : Horticultural Crops Development Authority

HCP : Horticultural Crop Production

HNO : Horticultural Nursery Operator

IDM : Integrated Disease Management

IPM : Integrated Pest Management

IWM : Integrated Weed Management

KCSE : Kenya Certificate of Secondary Education

KNQA : Kenya National Qualifications Authority

MESPT Micro Enterprises Support Programme Trust

MoALF : Ministry of Agriculture Livestock and Fisheries

MoEST : Ministry of Education Science and Technology

NGO : Non-Governmental Organization

NOS : National Occupation Standard

OS : Occupational Standard

OSHA : Occupation Safety and Health Act

PPE : Personal Protective Equipment

RPL : Recognition of Prior Learning

SSAC : Sector Skills Advisory Committee

TC : Tissue Culture

TVETA : Technical and Vocational Education and Training Authority

# **COURSE OVERVIEW**

This course is designed to equip an individual with competencies for horticultural produce processing. It further aims at equipping the individual with competencies for the storage of various horticultural produce, processing fruits, vegetables, flowers, nuts as well as herbs and spices.

The course is also designed to equip the individual with competencies to supervise the setting up and running of a horticultural processing business.

This course consists of the following basic and core units of learning:

**Basic Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
| HO/CU/HG/BC/01/5/B | Communication Skills | 25 | 2.5 |
| HO/CU/HG/BC/02/5/B | Numeracy Skills | 40 | 4 |
| HO/CU/HG/BC/03/5/B | Digital Literacy | 45 | 4.5 |
| HO/CU/HG/BC/04/5/B | Entrepreneurial Skills | 70 | 7 |
| HO/CU/HG/BC/05/5/B | Employability Skills | 50 | 5 |
| HO/CU/HG/BC/06/5/B | Environmental Literacy | 25 | 2.5 |
| HO/CU/HG/BC/07/5/B | Occupational Safety and Health Practices | 25 | 2.5 |
| **Total** | | **280** | **28** |

**Core Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factors** |
| HO/CU/HG/CR/01/5/B | Horticultural Produce Storage | 158 | 15.8 |
| HO/CU/HG/CR/02/5/B | Horticultural Fruits Processing | 194 | 19.4 |
| HO/CU/HG/CR/03/5/B | Horticultural Vegetables Processing | 146 | 14.6 |
| HO/CU/HG/CR/04/5/B | Horticultural Flowers Processing | 114 | 11.4 |
| HO/CU/HG/CR/05/5/B | Horticultural Nuts Processing | 166 | 16.6 |
| HO/CU/HG/CR/06/5/B | Horticultural Herbs and Spices Processing | 126 | 12.6 |
| HO/CU/HG/CR/07/5/B | Horticultural Processing Unit Operations Supervision | 130 | 13 |
|  | Industrial Attachment | 360 | 36 |
| **Total** | | **1394** | **139.4** |
| **Grand Total** | | **1674** | **167.4** |

**Entry Requirements**

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

1. Kenya Certificate of Secondary Education (KCSE) D (D plain)

**Or**

1. Certificate in Horticulture Processing Level 4

**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

**Industrial attachment**

An individual enrolled in this course will undergo twelve (12) weeks industrial attachment in a horticultural processing firm.

An individual enrolled in one of the core units of learning will undergo a two weeks attachment in a horticultural processing unit of a firm.

**Assessment**

The course will be assessed at two levels: internal and external.

1. **Internal assessment** conducted continuously by the trainer (internal assessor) who is monitored by an accredited internal verifier.
2. **External assessment** conducted by an 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 Record of Achievement on demonstration of competence in a unit of competency. To be awarded Certificate in Horticulture processing Level 5, an individual must demonstrate competence in all the units of competency.

# BASIC UNITS OF LEARNING

# COMMUNICATION SKILLS

**UNIT CODE:** HO/CU/HG/BC/01/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Communication Skills

**Duration of Unit:** 25hours

**Unit Description**

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, contributing to the development of communication strategies, conducting workplace interviews, facilitating group discussions and representing the organisation.

**Summary of Learning Outcomes**

1. Meet communication needs of clients and colleagues
2. Contribute to the development of communication strategies
3. Conduct interviews
4. Facilitate group discussions
5. Represent the organization

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Meet communication needs of clients and colleagues | * 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 * Active listening * Feedback * Interpretation * Flexibility in communication | * Interview * Third party reports * Written texts |
| 1. Contribute to the development of communication strategies | * Dynamics of groups * Styles of group leadership * Openness and flexibility in communication * Communication skills relevant to client groups | * Written * Observation |
| 1. Conduct interviews | * Types of interview * Establishing rapport * Facilitating resolution of issues * Developing action plans | * Written * Observation |
| 1. Facilitate group discussions | * Identification of communication needs * Dynamics of groups * Styles of group leadership * Presentation of information * Encouraging group members participation * Evaluating group communication strategies | * Written * Observation |
| 1. Represent the organization | * Presentation techniques * Development of a presentation * Multi-media utilization in presentation * Communication skills relevant to client groups | * Observation * Written |

**Suggested Methods of Instruction**

* Role playing
* Viewing of related videos

**Recommended Resources**

* Desktop computers/laptops
* Internet connection
* Projectors
* Telephone

# NUMERACY SKILLS

**UNIT CODE:** HO/CU/HG/BC/02/5/B

**Relationship to Occupational Standards:**

This unit addresses the Unit of Competency: Demonstrate Numeracy Skills

**Duration of Unit:** 40 hours

**Unit Description**

This unit covers the competencies required to demonstrate numeracy skills. It involves calculating with whole numbers and familiar fractions, decimals, and percentages for work estimating, measuring, and calculating with routine metric measurements for work, using routine maps and plans for work, interpreting, drawing and constructing 2D and 3D shapes for work, interpreting routine tables, graphs and charts for work, collecting data and constructing routine tables and graphs for work and using basic functions of calculator

**Summary of Learning Outcomes**

1. Calculate with whole numbers and familiar fractions, decimals and percentages for work
2. Estimate, measure and calculate with routine metric measurements for work
3. Use routine maps and plans for work
4. Interpret, draw and construct 2D and 3D shapes for work
5. Interpret routine tables, graphs and charts for work
6. Collect data and construct routine tables and graphs for work
7. Use basic functions of calculator

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Calculate with whole numbers and familiar fractions, decimals and percentages for work | * Interpretation of whole numbers, fractions, decimals, percentages and rates * Calculations involving several steps * Calculation with whole numbers and routine or familiar fractions, decimals and percentages * Conversion between equivalent forms of fractions, decimals and percentages * Application of order of operations to solve multi-step calculations * Application of problem solving strategies * Making estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task * Use of formal and informal mathematical language and symbolism to communicate the result of a task | * Written * Practical test * Observation |
| 1. Estimate, measure and calculate with routine metric measurements for work | * Selection and interpretation of measurement information in workplace tasks and texts * Identification and selection of routine measuring equipment * Estimation and making measurements using correct units * Estimation and calculation using routine measurements * Performing conversions between routinely used metric units * Using problem solving processes to undertake tasks * Recording information using mathematical language and symbols | * Written * Practical test * Observation |
| 1. Use routine maps and plans for work | * Identification of features in routine maps and plans * Symbols and keys used in routine maps and plans * Identification and interpretation of orientation of map to North * Demonstrate understanding of direction and location * Apply simple scale to estimate length of objects, or distance to location or object * Give and receive directions using both formal and informal language | * Written * Practical test * Observation |
| 1. Interpret, draw and construct 2D and 3D shapes for work | * Identify two dimensional shapes and routine three-dimensional shapes in everyday objects and in different orientations * Explain the use and application of shapes * Use formal and informal mathematical language and symbols to describe and compare the features of two-dimensional shapes and routine three-dimensional shapes * Identify common angles * Estimate common angles in everyday objects * Use formal and informal mathematical language to describe and compare common angles * Use common geometric instruments to draw two dimensional shapes * Construct routine three-dimensional objects from given nets | • Written  • Practical test  • Observation |
| 1. Interpret routine tables, graphs and charts for work | * Identify routine tables, graphs and charts in predominately familiar texts and contexts * Identify common types of graphs and their different uses * Identify features of tables, graphs and charts * Locate specific information * Perform calculations to interpret information * Explain how statistics can inform and persuade * Identify misleading statistical information * Discuss information relevant to the workplace | * Oral * Written * Practical test * Observation |
| 1. Collect data and construct routine tables and graphs for work | * Identify features of common tables and graphs * Identify uses of **different tables and graphs** * Determine data and variables to be collected * Determine audience * Select a method to collect data * Collect data * Collate information in a table * Determine suitable scale and axes * Draft and draw graph to present information * Check that data meets the expected results and context * Report or discuss information using formal and informal mathematical language | * Written * Practical test * Observation |
| 1. Use basic functions of calculator | * Identify and use keys for basic functions on a calculator * Calculate using whole numbers, money and routine decimals and percentages * Calculate with routine fractions and percentages * Apply order of operations to solve multi-step calculations * Interpret display and record result * Make estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task * Use formal and informal mathematical language and appropriate symbolism and conventions to communicate the result of the task | * Written * Practical test * Observation |

# Suggested Methods of Instruction

* Demonstrations
* Role playing
* Viewing of related videos
* Discussion
* Assignments

**Recommended resources**

* Calculators
* Basic measuring instruments

# DIGITAL LITERACY

**UNIT CODE:** HO/CU/HG/BC/03/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Digital Literacy

**Duration of Unit:** 45 hours

**Unit Description**

This unit covers the competencies required to demonstrate digital literacy. It involves identifying appropriate computer software and hardware, applying security measures to data, hardware, software in automated environment, applying computer software in solving tasks, applying internet and email in communication at workplace, applying desktop publishing in official assignment and preparing presentation packages.

**Summary of Learning Outcomes**

1. Identify computer software and hardware
2. Apply security measures to data, hardware, software in automated environment
3. Apply computer software in solving tasks
4. Apply internet and email in communication at workplace
5. Apply desktop publishing in official assignments
6. Prepare presentation packages

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify computer hardware and software | * Concepts of ICT * Functions of ICT * History of computers * Components of a computer * Classification of computers | * Written tests * Oral presentation * 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 * Laws governing protection of ICT | * Written tests * Oral presentation * Observation * Project |
| 1. Apply computer software in solving tasks | * Operating system * Word processing * Spread sheets * Data base design and manipulation * Data manipulation, storage and retrieval | * Oral questioning * Observation * Project |
| 1. Apply internet and email in communication at workplace | * Computer networks * Network configurations * Uses of internet * Electronic mail (e-mail) concept | * Oral questioning * Observation * Oral presentation * Written report |
| 1. Apply desktop publishing in official assignments | * Concept of desktop publishing * Opening publication window * Identifying different tools and tool bars * Determining page layout * Opening, saving and closing files * Drawing various shapes using DTP * Using colour pellets to enhance a document * Inserting text frames * Importing and exporting text * Object linking and embedding * Designing of various publications * Printing of various publications | * Oral questioning * Observation * Oral presentation * Written report * Project |
| 1. Prepare presentation packages | * Types of presentation packages * Procedure of creating slides * Formatting slides * Presentation of slides * Procedure for editing objects | * Oral questioning * Observation * Oral presentation * Written report * Project |

**Suggested Methods of Instruction**

* Demonstration
* Viewing of related videos
* Discussions
* Assignments
* Direct instructions

**Recommended Resources**

* Computers
* Other digital devices
* Printers
* Storage devices
* Internet access
* Computer software

# ENTREPRENEURIAL SKILLS

**UNIT CODE:** HO/CU/HG/BC/04/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Entrepreneurship

**Duration of unit:** 70 hours

**Unit Description**

This unit covers the competencies required to demonstrate understanding of entrepreneurship. It involves demonstrating understanding of an entrepreneur, entrepreneurship and self-employment. It also involves identifying entrepreneurship opportunities, creating entrepreneurial awareness, applying entrepreneurial motivation and developing business innovative strategies.

**Summary of Learning Outcomes**

* 1. Demonstrate understanding of an entrepreneur
  2. Demonstrate knowledge of entrepreneurship and self-employment
  3. Identify entrepreneurship opportunities
  4. Create entrepreneurial awareness
  5. Apply entrepreneurial motivation
  6. Develop innovative business strategies
  7. Develop Business plan

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Demonstrate knowledge of entrepreneurship and self-employment | * Importance of self-employment * Requirements for entry into self-employment * Role of an Entrepreneur in business * Contributions of Entrepreneurs to National development * Entrepreneurship culture in Kenya * Born or made entrepreneurs | * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Identify entrepreneurship opportunities | * Business ideas and opportunities * Sources of business ideas * Business life cycle * Legal aspects of business * Assessment of product demand * Business environment * Factors to consider when evaluating business environment * Technology in business | * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Create entrepreneurial awareness | * Forms of businesses * Sources of business finance * Factors in selecting source of business finance * Governing policies on Small Scale Enterprises (SSEs) * Problems of starting and operating SSEs | * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Apply entrepreneurial motivation | * Internal and external motivation * Motivational theories * Self-assessment * Entrepreneurial orientation * Effective communications in entrepreneurship * Principles of communication * Entrepreneurial motivation | * Case studies * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Develop business innovative strategies | * Innovation in business * Small business Strategic Plan * Creativity in business development * Linkages with other entrepreneurs * ICT in business growth and development | * Case studies * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |
| 1. Develop Business Plan | * Business description * Marketing plan * Organizational/Management * plan * Production/operation plan * Financial plan * Executive summary * Presentation of Business Plan | * Case studies * Individual/group assignments * Projects * Written tests * Oral questions * Third party report * Interviews |

**Suggested Methods of Instruction**

* Direct instruction
* Project
* Case studies
* Field trips
* Discussions
* Demonstration
* Question and answer
* Problem solving
* Experiential
* Team training

**Recommended Resources**

* Case studies
* Business plan templates
* Computers
* Overhead projectors
* Internet
* Mobile phone
* Video clips
* Films
* Newspapers and Handouts
* Business Journals
* Writing materials

# EMPLOYABILITY SKILLS

**UNIT CODE:** HO/CU/HG/BC/05/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Employability Skills

**Duration of Unit:** 50 hours

**Unit Description**

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading a workplace team, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing workplace ethics.

**Summary of Learning Outcomes**

1. Conduct self-management

2. Demonstrate interpersonal communication

3. Demonstrate critical safe work habits

4. Lead small teams

5. Plan and organize work

6. Maintain professional growth and development

7. Demonstrate workplace learning

8. Demonstrate problem solving skills

9. Demonstrate workplace ethics

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Conduct self-management | * Self-awareness * Formulating personal vision, mission and goals * Strategies for overcoming life challenges * Emotional intelligence * Assertiveness versus aggressiveness * 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 * Financial literacy * Healthy lifestyle practices | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate interpersonal communication | * Meaning of interpersonal communication * Listening skills * Types of audience * Writing skills * Reading skills * Meaning of empathy * Understanding customers’ needs * Establishing communication networks * Sharing information | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate critical safe work habits | * Stress and stress management * Punctuality and time consciousness * Leisure * Integratingpersonal objectives into organizational objectives * Resources utilization * Setting work priorities * HIV and AIDS * Drug and substance abuse * Handling emerging issues | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Lead a small team | * Leadership qualities * Team building * Determination of team roles and objectives * Team performance indicators * Responsibilities in a team * Forms of communication * Complementing team activities * Gender and gender mainstreaming * Human rights * Maintaining relationships * Conflicts and conflict resolution | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Plan and organize work | * Functions of management * Planning * Organizing * Time management * Decision making process * Task allocation * Evaluating work activities * Resource utilization * Problem solving * Collecting and organising information | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Maintain professional growth and development | * Opportunities for professional growth * Assessing training needs * Licenses and certifications for professional growth and development * Pursuing personal and organizational goals * Identifying work priorities * Recognizing career advancement | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate workplace learning | * 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 * Generating new ideas * Workplace innovation * Performance improvement * Handling emerging issues * Future trends and concerns in learning | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate problem solving skills | * Problem identification * Problem solving * Application of problem-solving strategies * Resolving customer concerns | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |
| 1. Demonstrate workplace ethics | * 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 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 | * Written tests * Oral questioning * Interviewing * Portfolio of evidence * Third party report |

**Suggested Methods of Instruction**

* Demonstrations
* Simulation/Role play
* Discussion
* Presentations
* Case studies
* Q&A

**Recommended Resources**

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

# ENVIRONMENTAL LITERACY

**UNIT CODE:** HO/CU/HG/BC/06/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Environmental Literacy

**Duration of Unit:** 25 hours

**Unit Description**

This unit describes the competencies required to demonstrate understanding of environmental literacy. It involves controlling environmental hazard, controlling control environmental pollution, complying with workplace sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs and monitoring activities on environmental protection/programs.

**Summary of Learning Outcomes**

1. Control environmental hazards
2. Control environmental Pollution
3. Demonstrate sustainable use of resource
4. Evaluate current practices in relation to resource usage
5. Identify Environmental legislations/conventions for environmental concerns
6. Implement specific environmental programs
7. Monitor activities on Environmental protection/Programs

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Control environmental hazards | * 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 test * Oral questions * Observation |
| 1. Control environmental Pollution control | * 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 test * Oral questions * Observation |
| 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 test * Oral questions * Observation |
| 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 test * Oral questions * Observation |
| 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 questions * Oral questions * Observation |
| 1. Implement specific environmental programs | * Community needs and expectations * Resource availability * 5 s of good housekeeping * Identification of programs/Activities * Setting of individual roles /responsibilities * Resolving problems /constraints encountered * Consultation with stakeholders | * Written questions * Oral questions * Observation |
| 1. Monitor activities on Environmental protection/Programs | * Periodic monitoring and Evaluation of activities * Gathering feedback from stakeholders * Analysing data gathered * Documentation of recommendations and submission * Setting of management support systems to sustain and enhance the program * Monitoring and reporting of environmental incidents to concerned /proper authorities | * Oral questions * Written tests * Practical test * Observation |

**Suggested Methods of Instruction**

* Instructor led facilitation of theory
* Demonstration by trainer
* Viewing of related videos
* Project
* Assignements
* Role play

**Recommended Resources**

* Standard operating and/or other workplace procedures manuals
* Specific job procedures manuals
* Environmental Management and Coordination Act 1999
* Machine/equipment manufacturer’s specifications and instructions
* Personal Protective Equipment (PPE)
* ISO standards
* Ccompany environmental management systems (EMS)
* Montreal Protocol
* Kyoto Protocol

# OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** HO/CU/HG/BC/07/5/B

**Relationship to Occupational Standards**

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

**Duration of Unit:** 25 hours

**Unit Description**

This unit specifies the competencies required to identify workplace hazards and risk, identify and implement appropriate control measures and implement OSH programs, procedures and policies/ guidelines

**Summary of Learning Outcomes**

1. Identify workplace hazards and risk
2. Control OSH hazards
3. Implement OSH programs

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify workplace hazards and risks | * Identification of hazards in the workplace and/or the indicators of their presence * Evaluation and/or work environment measurements of OSH hazards/risk existing in the workplace is conducted by * Authorized personnel or agency * Gathering of OHS issues and/or concerns raised | * Oral questions * Written tests * Portfolio of evidence * Third party report |
| 1. Control OSH hazards | * Prevention and control measures, including use of PPE (personal protective equipment) for specific hazards are identified and implemented * Appropriate risk controls based on result of OSH hazard evaluation is recommended * Contingency measures, including emergency procedures during workplace incidents and emergencies are recognized and established in accordance with organization procedures | * Oral questions * Written tests * Portfolio of evidence * Third party report |
| 1. Implement OSH programs | * Providing information to work team about company OHS program, procedures and policies/guidelines * Participating in implementation of OSH procedures and policies/ guidelines * Training of team members and advice on OSH standards and procedures * Implementation of procedures for maintaining OSH-related records | * 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**

* 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

## HORTICULTURAL PRODUCE STORAGE

**UNIT CODE:** HO/CU/HG/CR/01/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Store Horticultural Produce

**Duration of Unit:** 158 hours

**Unit Description**

This unit specifies the competencies required to store horticultural produce. It involves carrying out food safety risk assessment for storage of horticultural produce, preparing to store horticultural produce, storing horticultural produce, maintaining the food safety management plan, evaluating horticultural produce stored and completing horticultural produce storage

**Summary of Learning Outcomes**

1. Apply food safety measures in storing horticultural produce
2. Prepare to store horticultural produce
3. Store horticultural produce
4. Evaluate horticultural produce stored
5. Complete horticultural produce storage.

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1.Apply food safety measures in storing horticulture produce | * Meaning of food safety * Importance of food safety * Principles of food safety * Prerequisite programmes * Meaning, importance, categories and establishment of prerequisite programmes * Relevant pre-requisite programmes   + Good agricultural practices   + Good manufacturing practices   + Standard Sanitary Operating Procedures * Introduction to HACCP   + Meaning of HACCP   + Principles of HACCP * Food safety risk assessment   + Meaning of risk assessment   + Difference between risks and hazards   + Steps to conduct a risk assessment * Development of a food safety management system   + Development of the Food safety management plan * Listing hazards * Identifying preventive measures and their control limit * Establishing monitoring procedures * Establishing corrective action * Records to be kept * Checking and reviewing the plan   + Implementation of the food safety management plan     - Adoption     - Communication     - Resource allocation     - Practices and procedures   + Evaluation of the plan     - Verification     - Validation     - Third party evaluation * Standards and legislations in food safety in storing horticultural produce | * Written tests * Oral questioning * Observation * Case study * Third party reports * Practical reports |
| 2.Prepare to store horticultural produce | * Types of storage facilities * Determination of Market Demands * Horticultural produce procurement procedures * Tools, materials and equipment used and their uses * Horticultural produce handling * Sorting and grading methods * Record Keeping * Digital literacy | * Written tests * Observation * Oral questions * Third party report |
| 3. Store horticultural produce | * Horticultural produce stores management methods * Stores record keeping | * Written tests * Observation * Oral questions * Third party report |
| 4.Evaluate horticultural produce stored | * Food processing and handling * Market assessment methods * Basic accounting * Arithmetic calculations   . | * Written tests * Observation * Oral questions * Third party report |
| 5.Complete horticultural produce storage | * Horticultural produce waste management policies and regulations. * Managing cold chains * Documentation * Waste management | * Observation * Written tests * Oral questions * Third party report |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Field trips
* Discussions
* Direct instruction
* Simulation
* On job training

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| **Functional horticultural produce storage facility with the following:** | | |
| **Documents:**   * Stores management policy * Tool, materials and equipment inventory record * Market assessment reports * Waste management policies * Environmental management policies | | |
| **Tools** | **Materials** | **Equipment** |
| * Knives * Buckets * Bowls * Wheel barrows | * Water * Pallets * Horticultural produce * Power source * Poly bags * Labels | * Weighing scale * Trolleys * Cold storage equipment * Crates * First aid kit * Trays |

**HORTICULTURAL FRUITS PROCESSING**

**UNIT CODE:** HO/CU/HG/CR/02/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Process Horticultural Fruits

**Duration of Unit:** 194 hours

**Unit Description**

This unit specifies the competencies required to process horticultural fruits. It involves carrying out food safety risk assessment and maintaining the food safety management plan in setting up horticultural fruit processing facility, assembling horticultural produce storage tools, materials and equipment, acquiring the produce, receiving, making various fruit products, managing wastes and preparing the required fruit processing documentation.

**Summary of Learning Outcomes**

1. Apply food safety measures in processing horticultural fruits
2. Prepare to process horticultural fruits
3. Process horticultural fruits
4. Evaluate processed horticultural fruit products
5. Complete horticultural fruit processing.

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1.Apply food safety measures in processing horticultural fruits | * Meaning of food safety * Importance of food safety * Principles of food safety * Prerequisite programmes   + Meaning, importance, categories and establishment of prerequisite programmes   + Relevant pre-requisite programmes     - Good agricultural practices     - Good manufacturing practices   + Standard Sanitary Operating Procedures * Introduction to HACCP   + Meaning of HACCP   + Principles of HACCP * Food safety risk assessment   + Meaning of risk assessment   + Difference between risks and hazards   + Steps to conduct a risk assessment * Development of a food safety management system   + Development of the Food safety management plan * Listing hazards * Identifying preventive measures and their control limit * Establishing monitoring procedures * Establishing corrective action * Records to be kept * Checking and reviewing the plan   + Implementation of the food safety management plan     - Adoption     - Communication     - Resource allocation     - Practices and procedures   + Evaluation of the plan     - Verification     - Validation     - Third party evaluation * Standards and legislations in food safety in processing horticultural fruits | * Written tests * Oral questioning * Observation * Case study * Third party reports * Practical reports |
| 2.Prepare to process horticultural fruits | * Types of Horticultural fruits for processing * Setting up horticultural fruit processing facility * Business management principles * Market assessment methods * Horticultural fruit procurement procedures * Tools, materials and equipment used and their uses in fruit processing. * Horticultural produce handling * Sorting and grading methods * Food, personal and environmental hygiene * Safety and hygiene measures * Environmental management practices * Records keeping * Digital literacy | * Written tests * Observation * Oral questions * Third party report |
| 3.Process horticultural fruits | * Horticultural fruit processing:   + Fruit powders   + Jellies   + Jams   + Fruit puree   + Fruit sauces   + Slices   + Fruit wines   + Pastes   + Marmalades   + Juices * Fruit products packaging, labelling and storage. * Record keeping | * Written tests * Observation * Oral questions * Third party report |
| 4.Evaluate processed horticultural fruit products | * Food processing and handling * Basic cost accounting * Food quality standards and testing methods * Food preservation * Decision making | * Written tests * Observation * Oral questions * Third party report |
| 5.Complete horticultural fruit processing | * Fruit products stores management. * Horticultural fruit processing tools and equipment maintenance * Horticultural fruits waste management policies and regulations. * Report writing | * Observation * Written tests * Oral questions * Third party report |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Industrial attachment/ apprenticeship
* Discussions
* Direct instruction
* Simulation
* On job training

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| **Functional Horticultural fruit processing facility with the following:** | | |
| **Documents:**   * Fruits processing guidelines * Tool, materials and equipment inventory record * Market assessment reports * Waste management policies * Environmental management policies * Occupational Safety policy | | |
| **Tools** | **Materials** | **Equipment** |
| * Knives * Buckets * Sieves/ strains * Spoons * Sauce pans * Bowls * Measuring jars * Cups * Plates   Basins | * Packaging materials * Power * Raw materials * Preservatives * Labels * Wax * Water * Seals * Stationeries * Packing tapes | * Weighing scales * Sealers * Strapping machine * Trolleys * Boilers * Thermometers * Working benches * Crates * Trays * Packaging equipment * Fire fighting equipment * First aid kits * Metal detectors * pH meters * Refractometers * Blenders * Juice extractors |

# HORTICULTURAL VEGETABLES PROCESSING

**UNIT CODE:** HO/CU/HG/CR/03/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Process Horticultural Vegetables

**Duration of Unit:** 146 hours

**Unit Description**

This unit specifies the competencies required to process horticultural vegetables. It involves carrying out food safety risk assessment and maintaining the food safety management plan in setting up horticultural vegetable processing unit, acquiring the vegetables for processing, receiving, assembling vegetable processing tools, materials and equipment, making various vegetable products, managing wastes and preparing the required vegetable processing documentation.

**Summary of Learning Outcomes**

1. Apply food safety measures in processing horticultural vegetables
2. Prepare to process horticultural vegetables
3. Process processed horticultural vegetable products
4. Evaluate processed horticultural vegetable products
5. Complete horticultural vegetable processing.

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply food safety measures in processing horticultural vegetables | * Meaning of food safety * Importance of food safety * Principles of food safety * Prerequisite programmes   + Meaning, importance, categories and establishment of prerequisite programmes   + Relevant pre-requisite programmes     - Good agricultural practices     - Good manufacturing practices     - Standard Sanitary Operating Procedures * Introduction to HACCP   + Meaning of HACCP   + Principles of HACCP * Food safety risk assessment   + Meaning of risk assessment   + Difference between risks and hazards   + Steps to conduct a risk assessment * Development of a food safety management system   + Development of the Food safety management plan * Listing hazards * Identifying preventive measures and their control limit * Establishing monitoring procedures * Establishing corrective action * Records to be kept * Checking and reviewing the plan   + Implementation of the food safety management plan     - Adoption     - Communication     - Resource allocation     - Practices and procedures   + Evaluation of the plan     - Verification     - Validation     - Third party evaluation * Standards and legislations in food safety in processing horticultural vegetables | * Written tests * Oral questioning * Observation * Case study * Third party reports * Practical reports |
| 1. Prepare to process horticultural vegetables | * Types of Horticultural vegetables for processing * Setting up horticultural vegetables processing facility * Market assessment methods. * Procurement procedures. * Tools, materials and equipment used and their uses in horticultural vegetable processing. * Horticultural produce handling * Sorting and grading methods for horticultural vegetables * Food, personal and environmental hygiene * Horticultural vegetable processing working environment. * Safety and environmental protection * Digital literacy * Records keeping | * Written tests * Observation * Oral questions * Third party report |
| 1. Process horticultural vegetables | * Horticultural vegetable processing methods * Types of processed horticultural vegetable products. * Types of packaging materials used and their importance. * Food safety * Horticultural vegetable products packaging, labelling and storage * Record keeping | * Written tests * Observation * Oral questions * Third party report |
| 1. Evaluate Processed horticultural vegetable products | * Food processing and handling * Market assessment methods * Basic cost accounting * Food quality standards and testing methods. * Record keeping | * Written tests * Observation * Oral questions * Third party report |
| 1. Complete horticultural fruit processing | * Stores management practices. * Horticultural fruit processing tools and equipment maintenance * Horticultural vegetable waste management policies and regulations. * Reporting channels * Decision making | * Observation * Written tests * Oral questions * Third party report |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Industrial attachment/ apprenticeship
* Discussions
* Direct instruction
* Simulation
* On job training

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| **Functional horticultural vegetable processing facility with the following:** | | |
| **Documents:**   * Food handling policy guides * Vegetables processing guidelines * Tool, materials and equipment inventory record * Market assessment reports * Waste management policies * Environmental management policies * Occupational Safety policy | | |
| **Tools** | **Materials** | **Equipment** |
| * Knives * Buckets * Spoons * Sauce pans * Bowls * Plates * Basins | * Packaging materials * Power * Vegetables for processing * Preservatives * Labels * Stationeries * Water * Seals | * Weighing scales * Sealers * Strapping machine * Trolleys * Boilers * Thermometers * Working benches * Crates * Trays * Packaging equipment * Fire fighting equipment * First aid kits * Metal detectors * pH meters * Refractometers * Blenders * Juice extractors |

**HORTICULTURAL FLOWERS PROCESSING**

**UNIT CODE:** HO/CU/HG/CR/04/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Process horticultural flowers

**Duration of Unit:** 114 hours

**Unit Description**

This unit specifies the competencies required to process horticultural flowers. It involves setting up horticultural flower processing facility, assembling flower processing tools, materials and equipment, acquiring flowers for processing, sorting, grading and preservation as well as managing wastes and preparing the required horticultural flower processing documentation.

**Summary of Learning Outcomes**

1. Prepare to process horticultural flowers
2. Process horticultural flowers
3. Evaluate processed horticultural flower products
4. Complete horticultural flower processing.

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Prepare to process horticultural flowers | * Setting up horticultural flower processing facilities * Types of horticultural flowers * Market assessment methods * Procurement procedures * Tools, materials and equipment used and their uses in flower processing. * Horticultural flower handling * Flower sorting and grading methods * Pre-cooling methods * Safety and hygiene measures during flower processing * Records keeping * Digital literacy | * Written tests * Observation * Oral questions * Third party report |
| 1. Process horticultural flowers | * Flower processing methods * Types of processed horticultural flower products * Types of packaging, wrapping and sleeving materials | * Written tests * Observation * Oral questions * Third party report |
| 1. Evaluate horticultural flower processing | * Market assessment methods * Basic accounting * Flower quality assessment methods and techniques * Flower preservation methods | * Written tests * Observation * Oral questions * Third party report |
| 1. Complete horticultural flower processing | * Flower stores management. * Horticultural flower waste management policies and regulations. * Report writing | * Observation * Written tests * Oral questions * Third party report |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Industrial attachment
* Discussions
* Direct instruction
* On job training

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| **Functional horticultural flower processing facility with the following:** | | |
| **Documents:**   * Flower processing guidelines * Tool, materials and equipment inventory record * Market assessment reports * Waste management policies * Environmental management policies * Occupational Safety policy * Good agricultural practices guideline | | |
| **Tools** | **Materials** | **Equipment** |
| * Knives * Buckets * Secateurs | * Packaging materials * Power * Flowers for processing * Preservatives * Labels * Stationeries * Water * Straps * Hangers * Litter bins | * Strapping machine * Trolleys * Thermometers * Working benches * Trays * Packaging equipment * Fire fighting equipment * First aid kits * Driers |

**HORTICULTURAL NUTS PROCESSING**

**UNIT CODE:** HO/CU/HG/CR/05/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Process horticultural nuts

**Duration of Unit:** 166 hours

**Unit Description**

This unit specifies the competencies required to process horticultural nuts. It involves carrying out food safety risk assessment and maintaining the food safety management plan in setting up horticultural nut processing facility, assembling nut processing tools, materials and equipment, acquiring nuts for processing, receiving, sorting, grading and processing, managing wastes and preparing the required nut processing documentation.

**Summary of Learning Outcomes**

1. Apply food safety measures in processing horticultural nuts
2. Prepare to process horticultural nuts
3. Process horticultural nuts
4. Evaluate processed horticultural nut products
5. Complete horticultural nuts processing.

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1.Apply food safety measures in processing horticultural nuts | * Meaning of food safety * Importance of food safety * Principles of food safety * Prerequisite programmes   + Meaning, importance, categories and establishment of prerequisite programmes   + Relevant pre-requisite programmes     - Good agricultural practices     - Good manufacturing practices     - Standard Sanitary Operating Procedures * Introduction to HACCP   + Meaning of HACCP   + Principles of HACCP * Food safety risk assessment   + Meaning of risk assessment   + Difference between risks and hazards   + Steps to conduct a risk assessment * Development of a food safety management system   + Development of the Food safety management plan * Listing hazards * Identifying preventive measures and their control limit * Establishing monitoring procedures * Establishing corrective action * Records to be kept * Checking and reviewing the plan   + Implementation of the food safety management plan     - Adoption     - Communication     - Resource allocation     - Practices and procedures   + Evaluation of the plan     - Verification     - Validation     - Third party evaluation * Standards and legislations in food safety in processing horticultural nuts | * Written tests * Oral questioning * Observation * Case study * Third party reports * Practical reports |
| 2.Prepare to process horticultural nuts | * Types of horticultural nuts for processing * Setting up horticultural nuts processing facilities * Market assessment methods * Procurement procedures * Tools, materials and equipment used and their uses in horticultural nut processing * Horticultural nuts handling * Nuts sorting and grading methods * Safety and hygiene measures during nut processing. * Records keeping * Food, personal and environmental hygiene. | * Written tests * Observation * Oral questions * Third party report |
| 3.Process horticultural nuts | * Horticultural nuts processing methods * Types of processed horticultural nut products * Horticultural nut packaging, labelling and storage * Legal requirements for horticultural nuts | * Written tests * Observation * Oral questions * Third party report |
| 4.Evaluate processed horticultural nut processing | * Market assessment methods * Basic cost accounting * Food processing and handling * Food quality standards and testing methods | * Written tests * Observation * Oral questions * Third party report |
| 5.Complete horticultural nuts processing | * Stores management practices. * Horticultural nut processing tools and equipment maintenance. * Horticultural nuts waste management policies and regulations. Reporting channels * Decision making process * Business management * Product market analysis * Report writing | * Observation * Written tests * Oral questions * Third party report |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Industrial attachment
* Discussions
* Direct instruction
* Simulations
* On job training

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| **Functional horticultural nut processing facility with the following:** | | |
| **Documents:**   * Horticultural nuts processing guidelines * Tool, materials and equipment inventory record * Market assessment reports * Waste management policies * Environmental management policies * Occupational Safety policy Tools, materials &supplies and equipment inventory * Food handling policies * Procurement policies * Organisation policy. | | |
| **Tools** | **Materials** | **Equipment** |
| * Knives * Buckets * Spoons * Sauce pans * Drying mats * Bowls * Plates * Basins | * Packaging materials * Power * Heat * Nuts for processing * Preservatives * Labels * Stationeries * Water * Litter bins * Poly bags * Salt | * Strapping machine * Trolleys * Thermometers * Working benches * Trays * Packaging equipment * Fire fighting equipment * First aid kits * Driers * Milling machine |

# HORTICULTURAL HERBS AND SPICES PROCESSING

**UNIT CODE:** HO/CU/HG/CR/06/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Process horticultural herbs and spices

**Duration of Unit:** 126 hours

**Unit Description**

This unit specifies the competencies required to process horticultural herbs and spices. It involves carrying out food safety risk assessment and maintaining the food safety management plan in setting up horticultural herbs and spices processing facilities, assembling herbs and spices processing tools, materials and equipment, acquiring herbs and spices for processing, receiving, sorting, grading, processing to various products, managing wastes and preparing the required documentation.

**Summary of Learning Outcomes**

1. Apply food safety measures in processing horticultural herbs and spices
2. Prepare to process horticultural herbs and spices
3. Process horticultural herbs and spices
4. Evaluate processed horticultural herbs and spices products
5. Complete horticultural herbs and spices processing.

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1.Apply food safety measures in processing horticultural herbs and spices | * Meaning of food safety * Importance of food safety * Principles of food safety * Prerequisite programmes   + Meaning, importance, categories and establishment of prerequisite programmes   + Relevant pre-requisite programmes     - Good agricultural practices     - Good manufacturing practices     - Standard Sanitary Operating Procedures * Introduction to HACCP   + Meaning of HACCP   + Principles of HACCP * Food safety risk assessment   + Meaning of risk assessment   + Difference between risks and hazards   + Steps to conduct a risk assessment * Development of a food safety management system   + Development of the Food safety management plan * Listing hazards * Identifying preventive measures and their control limit * Establishing monitoring procedures * Establishing corrective action * Records to be kept * Checking and reviewing the plan   + Implementation of the food safety management plan     - Adoption     - Communication     - Resource allocation     - Practices and procedures   + Evaluation of the plan     - Verification     - Validation     - Third party evaluation * Standards and legislations in food safety in processing horticultural herbs and spices | * Written tests * Oral questioning * Observation * Case study * Third party reports * Practical reports |
| 2.Prepare to process horticultural herbs and spices | * Types of horticultural herbs and spices * Setting up horticultural herbs and spices processing units. * Market assessment methods * Procurement procedures * Tools, materials and equipment used and their uses in herbs and spices processing. * Food handling methods * First aid * Records keeping | * Written tests * Observation * Oral questions * Third party report |
| 3.Process horticultural herbs and spices | * Herbs processing methods * Spices processing methods * Types of processed horticultural herbs and spices products * Types of packaging materials for processed herbs and spices. * Herbs and spices packaging, labelling and storage * Record keeping | * Written tests * Observation * Oral questions * Third party report |
| 4.Evaluate processed horticultural herbs and spices products | * Market assessment methods * Basic cost accounting * Food processing and handling * Food quality standards and testing methods * Food preservation methods * Record keeping | * Written tests * Observation * Oral questions * Third party report |
| 5.Complete horticultural herbs and spices processing | * Stores management practices. * Horticultural herbs and spices processing tools and equipment maintenance. * Horticultural herbs and spices waste management policies and regulations. * Report writing skills * Decision making methods * Produce market analysis * Business management | * Observation * Written tests * Oral questions * Third party report |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Industrial attachment
* Discussions
* Direct instruction
* Simulation
* On job training

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| **Functional herbs and spices processing facility with the following:** | | |
| **Documents:**   * Herbs and spices processing guidelines * Tool, materials and equipment inventory record * Market assessment reports * Waste management policies * Environmental management policies * Occupational Safety policy | | |
| **Tools** | **Materials** | **Equipment** |
| * Knives * Buckets * Spoons * Sauce pans * Bowls * Plates * Mortars and pestles * Basins | * Packaging materials * Power * Herbs and spices for processing * Preservatives * Labels * Driers * Salts * Heat * Stationeries * Water * Seals | * Weighing scales * Sealers * Strapping machine * Trolleys * Boilers * Thermometers * Working benches * Crates * Trays * Packaging equipment * Fire fighting equipment * First aid kits |

**HORTICULTURAL PROCESSING UNIT OPERATIONS SUPERVISION**

**UNIT CODE:** HO/CU/HG/CR/07/5/B

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: supervise horticultural processing unit operations

**Duration of Unit:** 130 hours

**Unit Description**

This unit specifies the competencies required to oversee horticultural processing unit operations. It involves carrying out food safety risk assessment and maintaining the food safety management plan in preparing the processing unit annual plan, allocating resources to unit departments, monitoring performance, appraising staff and preparing processing unit documentation.

**Summary of Learning Outcomes**

1. Apply food safety measures in supervising horticultural processing unit operations
2. Prepare to supervise Horticultural processing unit operations
3. Supervise Horticultural processing unit operations
4. Evaluate supervision of Horticultural processing unit operations
5. Complete supervision of Horticultural processing unit operations

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Apply food safety measures in supervising horticultural processing unit operations | * Meaning of food safety * Importance of food safety * Principles of food safety * Prerequisite programmes   + Meaning, importance, categories and establishment of prerequisite programmes   + Relevant pre-requisite programmes     - Good agricultural practices     - Good manufacturing practices     - Standard Sanitary Operating Procedures * Introduction to HACCP   + Meaning of HACCP   + Principles of HACCP * Food safety risk assessment   + Meaning of risk assessment   + Difference between risks and hazards   + Steps to conduct a risk assessment * Development of a food safety management system   + Development of the Food safety management plan * Listing hazards * Identifying preventive measures and their control limit * Establishing monitoring procedures * Establishing corrective action * Records to be kept * Checking and reviewing the plan   + Implementation of the food safety management plan     - Adoption     - Communication     - Resource allocation     - Practices and procedures   + Evaluation of the plan     - Verification     - Validation     - Third party evaluation * Standards and legislations in food safety in supervising horticultural processing unit operations | * Written tests * Oral questioning * Observation * Case study * Third party reports * Practical reports |
| 1. Prepare to supervise Horticultural processing unit operations | * Strategic planning * Types of plans and their preparation methods. * Resource mobilisation and fund raising * Market assessment methods * Records keeping. * Human resources management * Business operating environment | * Written tests * Observation * Oral questions * Third party report |
| 1. Supervise horticultural processing unit operations | * Business management practices * Financial accounting * Human resources management * Record keeping * Marketing assessment reports interpretation | * Written tests * Observation * Oral questions * Third party report |
| 1. Evaluate supervision of horticultural processing unit operations | * Market assessment methods * Basic accounting * Business monitoring and evaluation * Record keeping | * Written tests * Observation * Oral questions * Third party report |
| 1. Complete supervision of horticultural processing unit operations | * Report writing * Performance management * Decision making * Business management * Interpreting management plans | * Observation * Written tests * Oral questions * Third party report |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Industrial attachment
* Discussions
* Direct instruction
* Simulation
* On job training

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| **A Properly supervised horticultural processing unit with the following:** | | |
| **Documents:**   * Strategic plans * Production plans * Annual plans * Operations plans * Staffing policy * Staff appraisals * Factory act | | |
| **Tools** | **Materials** | **Equipment** |
| * Performance contracts * Performance appraisal systems * Staff appraisal guides * Work plans * Monitoring and evaluation templates | * Stationeries * Human resources manuals * Management documents | * ICT equipment * Fire fighting equipment * First aid kits |