****

**REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

**SWEET POTATO PRODUCTION AND PROCESSING TECHNOLOGY**

**LEVEL 5**

****

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’s Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution and this resulted in the formulation of the Policy Framework for Reforming Education and Training. 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 Sweet Potato sector’s growth and development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

Kenya’s 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 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 Sweet Potato Sector Skills Advisory Committee (SSAC) have developed this curriculum.

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

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

I am grateful to the Council Members, Council Secretariat, Sweet Potato 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 Sweet Potato Sector Skills Advisory Committee (SSAC) in ensuring that competencies required by the industry are addressed in the curriculum. I also thank all stakeholders in Sweet Potato 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 Sweet Potato Production and Processing Technician Sector acquire the competencies that will enable them to perform their work more efficiently and effectively.

**COUNCIL SECRETARY/CEO**

**TVET CDACC**

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# ACRONYMS AND ABBREVIATIONS

A Control Version

AEZ Agro – Ecological Zones

AGR Agriculture and rural development

BC Basic Competency

CBET Competency-Based Education and Training

CC Common Competency

CDACC Curriculum Development, Assessment and Certification Council

CR Core Competency

CU Curriculum

HACCP Hazard Analysis Critical Control Points

ICT Information communication technology

KEBS Kenya Bureau of Standards

KEPHIS Kenya Plant Health Inspectorate Service

NEMA National Environment Management Authority

OSH Occupational Safety and Health

PPEs Personal Protective Equipment

SOPs Standard Operating Procedures

SPP Sweet Potato Production and Processing

TVET Technical and Vocational Education and Training

# KEY TO UNIT CODE

 **AGR/CU/SPP/BC/01/5/A**

Industry or sector

Curriculum

Occupational area

Type of competency

Competency number

Competency level

Control version

# COURSE OVERVIEW

Sweet potato Production and Processing Technology Certificate level 5 qualification consists of units of learning that a person must achieve to carry out farm planning and land preparation, produce sweet potato seed materials and roots. It also enables an individual to produce sweet potato puree, sweet potato flour, sweet potato crisps, dry sweet potato chips and to manage food safety and quality assurance.

The units of learning leading to Sweet potato Production and Processing Technician certificate Level 5 qualification include the following basic and core:

**Basic Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit factor** |
| AGR/CU/SPP/BC/01/5/A | Communication skills | 25 | 2.5 |
| AGR/CU/SPP/BC/02/5/A | Numeracy skills  | 40 | 4 |
| AGR/CU/SPP/BC/03/5/A | Digital literacy | 45 | 4.5 |
| AGR/CU/SPP/BC/04/5/A | Entrepreneurial skills | 70 | 7 |
| AGR/CU/SPP/BC/05/5/A | Employability skills | 50 | 5 |
| AGR/CU/SPP/BC/06/5/A | Environmental literacy | 25 | 2.5 |
| AGR/CU/SPP/BC/07/5/A | Occupational safety and health practices | 25 | 2.5 |
| **Total** | **280** | **28** |

**Core** **Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit factor** |
| AGR/CU/SPP/CR/01/5/A | Farm planning | 80 | 8 |
| AGR/CU/SPP/CR/02/5/A | Land preparation | 80 | 8 |
| AGR/CU/SPP/CR/03/5/A | Sweet potato seed materials | 120 | 12 |
| AGR/CU/SPP/CR/04/5/A | Sweet potato roots | 120 | 12 |
| AGR/CU/SPP/CR/05/5/A | Sweet potato puree | 100 | 10 |
| AGR/CU/SPP/CR/06/5/A | Sweet potato flour | 100 | 10 |
| AGR/CU/SPP/CR/07/5/A | Sweet potato crisps | 100 | 10 |
| AGR/CU/SPP/CR/08/5/A | Dry Sweet potato chips | 90 | 9 |
| AGR/CU/SPP/CR/09/5/A | Food safety and Quality Assurance | 100 | 10 |
|  | Industrial attachment | 360 | 36 |
| **Total** | **1250** | **125** |
| **Grand total** | **1530** | **153** |

The total duration of the course for an average trainee is 1530 hours including 360 hours (12 weeks) of field attachment

**Entry Requirements**

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

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

**Or**

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

**Field attachment**

An individual enrolled in this course will undergo a field attachment for a period of 12 weeks in a Sweet potato production and processing plant.

**Assessment**

The course will be assessed at two levels:

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

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

**Certification**

An individual will be awarded a Certificate of Competency on demonstration of competence in a unit of competency. To be awarded Certificate in Sweet Potato Production and Processing Technology Level 5, an individual must demonstrate competence in all the units of competency.

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

# BASIC UNITS OF LEARNING

# COMMUNICATION SKILLS

**UNIT CODE:** AGR/CU/SPP/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 Instructions**

* Role playing
* Viewing of related videos

**Recommended Resources**

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

# NUMERACY SKILLS

**UNIT CODE:** AGR/CU/SPP/BC/02/5/A

**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 Instructions**

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

**Recommended resources**

* Calculators
* Basic measuring instruments

# DIGITAL LITERACY

**UNIT CODE:** AGR/CU/SPP/BC/03/5/A

**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 Instructions**

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

**Recommended Resources**

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

# ENTREPRENEURSHIP SKILLS

**UNIT CODE:** AGR/CU/SPP/BC/04/5/A

Relationship to occupational standards

This unit addresses the Unit of Competency: Demonstrate Understanding of 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 instructions:**

* 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:** AGR/CU/SPP/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 Instructions**

* 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:** AGR/CU/SPP/BC/06/5/A

**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 Instructions**

* 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:** AGR/CU/SPP/BC/07/5/A

**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 Instructions**

* 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

# FARM PLANNING

**UNIT CODE:** AGR/CU/SPP/CR/01/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Carry out farm planning

**Duration of Unit:** 80 Hours

**Unit Description**

This unit specifies the competencies required to carry out farm planning. It involves carrying out site selection, determining farm layout and conducting soil testing. It also entails determining soil, soil-water and water conservation structures and determining farm budget.

**Summary of Learning Outcomes**

1. Carry out site selection
2. Determine farm layout
3. Conduct soil testing
4. Determine soil, soil-water and water conservation structures
5. Determine farm budget

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Carry out site selection
 | * Importance of site selection
* Factors influencing site selection
* Criteria of site selection
* Types of soils ideal for sweet potato production
 | * Oral questioning
* Written test
* Practical test
* Observation
 |
| 1. Determine farm layout
 | * Importance of farm layout
* Factors in determining farm layout
* Principles of farm layout
* Farm layout designs
* Technical drawing of farm layouts
 | * Written tests
* Oral questioning
* Practical test
* Observation
 |
| 1. Conduct soil testing
 | * Importance of soil testing
* Soil sampling methods
* Soil sampling procedures
* Soil sample preparation
* Methods of soil testing
	+ In situ
		- Rapid soil testing techniques
		- Visual tests
	+ Ex situ
* Interpretation of soil test results and recommendations
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |
| 1. Determine soil, soil-water and water conservation structures
 | * Importance of soil, soil-water and water conservation
* Methods of soil conservation
	+ Agronomical methods
	+ Vegetative method
	+ Structural methods
* Method of soil-water conservation
	+ Use of compost manure
	+ Mulching
	+ Conservation tillage
	+ Contour ploughing
	+ Strip cropping
	+ Sunken beds
* Methods of water conservation
	+ Small earth dams
* Soil conservation structures
	+ Fanya juu terraces
	+ Cut off drains
	+ Fanya chini terraces
	+ Retention ditches
	+ Grass strips
	+ Hedge rows
	+ Contour bunds
* Soil – water conservation structures
	+ In-situ water harvesting systems
	+ Ex-situ water harvesting systems
	+ Trapozoidal bunds
	+ Zai pits
	+ Negarims
	+ Mulching
	+ Plastic membranes
* Water conservation structures
	+ Water ponds
	+ Small earth dams
	+ Water pans
* EMCA 1999 Act
 | * Written tests
* Oral questions
* Practical tests
* Observations
 |
| 1. Prepare farm budget
 | * Importance of budgeting
* Types and components of a budget
	+ Complete budget
	+ Partial budget
* Approaches to budgeting
* Budgeting process
* Business plan
* Gross Margin analysis
 | * Written tests
* Supervised exercise
* Oral questions
* Case study
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/ site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Computer aided learning
* Relevant videos

**List of Recommended Resources**

* Computer
* Stationery
* Personal protective equipment’s (PPEs)
* Soil sampling equipment
* Rapid soil test kits
* Projector
* Flip charts
* Business plan template

# LAND PREPARATION

**UNIT CODE:** AGR/CU/SPP/CR/02/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Carry out land preparation

**Duration of Unit:** 80 Hours

**Unit Description**

This unit specifies the competencies required to carry out land preparation. It involves clearing land, constructing soil, soil-water and water conservation structures and carrying out tillage and preparing seedbed.

**Summary of Learning Outcomes**

1. Clear land
2. Construct soil, soil-water and water conservation structures
3. Carry out tillage
4. Prepare seedbed

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Clear land
 | * Importance of land clearing
* Methods of land clearing
* Factors to consider in land clearance
* Tools and equipment for clearing land
* Waste disposal
 | * Written tests
* Observation
* Oral questions
* Practical test
* Third party report
 |
| 1. Construct soil, soil-water and water conservation structures
 | * Introduction to soil, soil-water and water conservation structures
	+ Importance of soil, soil-water and water conservation
	+ Factors to consider in constructing soil, soil-water and water conservation structures
* Types of soil, soil-water and water conservation structures
* Measurement of slope or gradient
* Tools and equipment for construction of soil, soil-water and water conservation structures
* Construction of soil conservation structures
* Construction of soil – water conservation structures
* Construction of water conservation structures
* Irrigation system set up
	+ Sprinkler irrigation
	+ Farrow irrigation
	+ Drip irrigation
 | * Written tests
* Observation
* Oral questions
* Practical test
* Project
 |
| 1. Carry out tillage
 | * Importance of tillage
* Advantages and disadvantages of tillage
* Methods of tillage
	+ Manual
	+ Mechanical
	+ Chemical
* Types of tillage
	+ Conservation tillage
	+ Primary tillage
	+ Secondary tillage
 | * Written tests
* Observation
* Oral questions
* Practical test
* Project
 |
| 1. Prepare seedbed
 | * Significance of seedbed preparation
* Types of seedbeds and their advantages and disadvantages
* Ridges
* Mounds
* Flatbeds
* Spacing dimensions for different types of seedbeds under various AEZ
* Factors to consider when preparing seedbed
* Tools and equipment used for preparing seedbed
 | * Written tests
* Observation
* Oral questions
* Practical test
* Project
 |

**Suggested Methods of Instruction**

* Direct instruction
* Group discussions
* Field trips /site visits
* Demonstration by trainer
* Practice by the trainees
* Viewing of related videos

**List of Recommended Resources:**

* Tools and equipment for land clearance, tillage and seedbed preparation
* Tools for soil, soil-water and water conservation structures
* PPEs
* Computers
* Standard manuals/SOPs
* Projectors
* Flip charts
* Internet
* Relevant videos

# SWEET POTATO SEED MATERIALS

**UNIT CODE:** AGR/CU/SPP/CR/03/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce sweet potato seed materials

**Duration of Unit:** 120 Hours

**Unit Description**

This unit specifies the competencies required to produce sweet potato seed materials. It involves preparing seed production budget, carrying out site selection, selecting sweet potato variety, preparing seedbed, procuring planting materials, supplies and other inputs and preparing planting materials. It also involves planting seed material, maintaining seed field, harvesting seed materials and handling harvested seed material.

**Summary of Learning Outcomes**

1. Determine vine production budget
2. Carry out site selection
3. Select sweet potato variety
4. Prepare seedbed
5. Procure planting materials, supplies and other inputs
6. Prepare planting materials
7. Plant seed material
8. Maintain seed field
9. Harvest seed material
10. Handle harvested seed material

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Prepare seed material production budget
 | * Importance of budgeting
* Types and components of a budget
	+ Complete budget
	+ Partial budget
* Approaches to budgeting
* Budgeting process
 | * Oral questions
* Written tests
* Supervised Exercise
* Case study
 |
| 1. Carry out site selection
 | * Importance of site selection for seed material production
* Factors influencing site selection
* Criteria of site selection
 | * Written tests
* Observation
* Oral questioning
* Practical tests
 |
| 1. Select sweet potato variety
 | * Significance of variety selection
* Sweet potato varieties, their characteristics and attributes
* Factors considered in selecting the sweet potato varieties
 | * Written tests
* Oral questions
* Case study
* Practical test
 |
| 1. Prepare nursery bed
 | * Importance of preparing a nursery bed
* Factors influencing choice of a nursery
* Types of nursery beds
	+ Sunken beds
	+ Raised beds
	+ Flat beds
* Types of nursery systems, their advantages and disadvantages
	+ Rapid multiplication
	+ Conventional nurseries
	+ Tray nurseries
 | * Written tests
* Observation
* Oral questions
* Practical test
* Project
 |
| 1. Procure planting materials, supplies and other inputs
 | * Types of supplies and other inputs for vine production
* Sources of clean / quality planting materials
* Procurement procedures
	+ Market led procurement
	+ Players involved in procurement of planting materials, supplies and inputs
 | * Written tests
* Oral questions
* Practical tests
* Supervised exercises
* Case study
 |
| 1. Prepare planting materials
 | * Types of planting materials
	+ Vines
	+ Splits
	+ Seedlings
* Hardening planting materials
	+ Importance of hardening
	+ Hardening process
* Cutting planting materials
* Treating planting materials
* Preservation of planting materials
	+ Importance of preservation
	+ Methods of preservation
 | * Written tests
* Observation
* Oral questions
* Practical test
* Project
 |
| 1. Plant seed material
 | * Methods of propagation for different planting materials under various nursery systems
* Seed planting under various nursery systems and planting material
	+ Seed rates and spacing
	+ Fertilizer rates and application
	+ Watering
* Labelling
	+ Seed materials
	+ Nurseries
* Seed certification
	+ Certification standards
	+ Certification process
 | * Written tests
* Observation
* Oral questions
* Practical test
* Project
* Third party report
 |
| 1. Maintain seed field
 | * Weed and weed control
	+ Economic importance of weeds
	+ Types of weeds
	+ Methods of weed control
* The process and importance of gapping and rogueing
* Pest and disease control
	+ Definition of pests and diseases
	+ Identification of common pests and diseases in sweet potatoes
	+ Economic importance of pests and diseases
	+ Factors influencing occurrence and distribution of pests and diseases
	+ Methods of pest and disease control
	+ Effective use of chemicals
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |
| 1. Harvest seed material
 | * Determining harvest time for seed materials
* Tools and equipment for harvesting seed materials
* Harvesting techniques
	+ Cutting vines with sharp tool
	+ Lifting / uprooting seedlings from the beds
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |
| 1. Handle harvested seed material
 | * Significance of proper handling
* Sorting and conditioning of seed material after harvesting
* Labeling and packaging of seed material
* Seed material and seedlings storage under cool conditions
* Seed material and seedlings dispatch
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Exercises

**List of Recommended Resources**

* Computers
* Projectors
* Flip charts
* Calculators
* Internet
* Stationery
* Sweet potato varieties
* Demo plots
* Tools, equipment, materials and supplies for;
	+ - Seed bed preparation
		- Planting
		- Weeding
		- Controlling pests and diseases
		- Harvesting
* Plot labels

# SWEET POTATO ROOTS

**UNIT CODE:** AGR/CU/SPP/CR/04/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce sweet potato roots

**Duration of Unit:** 120 Hours

**Unit Description**

This unit specifies the competencies required to produce sweet potato roots. It involves preparing root production budget, carrying out site selection, selecting sweet potato variety, preparing land and procuring planting materials, supplies and other inputs. It also involves preparing planting materials, planting sweet potato seed materials, managing sweet potato crop, harvesting sweet potato roots, handling harvested sweet potato roots

**Summary of Learning Outcomes**

1. Determine root production budget
2. Carry out site selection
3. Select sweet potato variety
4. Prepare land
5. Procure planting materials, supplies and other inputs
6. Prepare planting materials
7. Plant sweet potato seed material
8. Manage sweet potato crop
9. Harvest sweet potato roots
10. Handle harvested sweet potato roots

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Prepare root production budget
 | * Importance of budgeting
* Types and components of a budget
	+ Complete budget
	+ Partial budget
* Approaches to budgeting
* Budgeting process
 | * Oral questions
* Written tests
* Supervised exercises
* Case study
 |
| 1. Carry out site selection
 | * Importance of site selection for sweet potato root production
* Factors influencing site selection
* Criteria for site selection
* Soil types ideal for sweet potato root production
 | * Written tests
* Observation
* Oral questioning
* Practical tests
 |
| 1. Select sweet potato variety
 | * Significance of variety selection
* Sweet potato varieties, their characteristics and attributes
* Factors considered in selecting the sweet potato varieties
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |
| 1. Prepare land
 | * Importance of land preparation
* Tools and equipment for land preparation
* Tillage methods
* Preparation of mounds
* Preparation of ridges
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |
| 1. Procure planting materials, supplies and other inputs
 | * Types of supplies and other inputs for root production
* Sources of clean / quality planting materials
* Procurement procedures
	+ Market led procurement
 | * Written tests
* Oral questions
* Practical tests
* Supervised exercises
* Case study
 |
| 1. Prepare planting materials
 | * Types of planting materials for root production
* Hardening planting materials
	+ Importance of hardening
	+ Hardening process
* Cutting planting materials
* Treating planting materials
* Preservation of planting materials
	+ Importance of preservation
	+ Methods of preservation
 | * Written tests
* Observation
* Oral questions
* Practical test
* Project
 |
| 1. Plant sweet potato seed material
 | * Time of planting
* Cropping systems
	+ Inter cropping
	+ Mono cropping
	+ Relay cropping
* Determination of right spacing, depth and orientation
* Application of fertilizer
	+ Organic
	+ Inorganic
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |
| 1. Manage sweet potato crop
 | * Plant health management
* Rogueing and gapping
* Earthing up
* Weeds and weed control
* Pests and diseases identification and their management
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |
| 1. Harvest sweet potato roots
 | * Determination of root maturity for harvesting
* Tools and equipment for harvesting roots
* Harvesting practices for sweet potato roots
	+ Piece meal harvesting
	+ Complete harvesting
* Harvesting methods
	+ Manual
	+ Mechanized
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |
| 1. Handle harvested sweet potato roots
 | * Factors that contribute to post-harvest losses of sweet potato roots
	+ Basic biological properties of roots
	+ Handling techniques
* Aggregation and transportation of roots
* Cleaning, sorting and grading of roots
* Curing roots
* Labelling, coding and packaging of roots
* Storage of roots
	+ Storage conditions
	+ Methods of storage
 | * Written tests
* Oral questions
* Observation
* Practical tests
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Exercises

**List of Recommended Resources**

* Computers
* Projectors
* Flip charts
* Calculators
* Internet
* Stationery
* Sweet potato varieties
* Demo plots
* Tools, equipment, materials and supplies for;
	+ Land preparation
	+ Planting
	+ Weeding
	+ Controlling pests and diseases
	+ Harvesting
* Plot labels

# SWEET POTATO PUREE

**UNIT CODE:** AGR/CU/SPP/CR/05/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce sweet potato puree

**Duration of Unit:** 100 Hours

**Unit Description**

This unit specifies the competencies required to produce sweet potato puree. It involves procuring sweet potato roots, sorting and grading sweet potato roots, washing sweet potato roots, steaming and cooling sweet potato roots and pureeing steamed sweet potato roots. It also involves packaging sweet potato puree, storing sweet potato puree and dispatching sweet potato puree.

**Summary of Learning Outcomes**

1. Procure sweet potato roots
2. Sort and grade sweet potato roots
3. Wash sweet potato roots
4. Steam and cool sweet roots
5. Puree steamed sweet potato roots
6. Package sweet potato puree
7. Store sweet potato puree
8. Dispatch sweet potato puree

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Procure sweet potato roots
 | * Introduction to procurement
* Objectives of procuring sweet potatoes
* Procurement methods
* Procurement procedure
	+ Contract farming
* Record keeping- purchase request, approval, delivery documents, root inspection reports, invoices, payment records
* Logistics management and material handling
	+ Tools and equipment
	+ Transportation and storage of sweet potatoes
 | * Observation
* Oral questions
* Written tests
* Practical tests
* Case study
 |
| 1. Sort and grade sweet potato roots
 | * Definition of sorting and grading.
* Significance of sorting and grading
* Sorting and grading methods
* Root quality attributes-flesh color, shape, size, skin quality
* Storage of sweet potatoes-Temperature, relative humidity, ventilation and light regulation.
* Tools, equipment and calibration-Electronic scales
 | * Observation
* Oral questions
* Written tests
* Practical tests
 |
| 1. Wash sweet potato roots
 | * Importance of washing sweet potatoes
* Raw material contaminants
* Methods of washing
	+ Manual
	+ Mechanical
* Factors determining the choice of washing method
* Operation and maintenance of washing machines & equipment
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |
| 1. Steam and cool sweet potato roots
 | * Size reduction and its significance
* Principles of size reduction
* Size reduction methods
* Size reduction tools and equipment
* Cooking/preparation methods
	+ Boiling
	+ Steaming
	+ Microwave technique.
* Advantages and Disadvantages of each cooking method
* Effects of each cooking method on puree quality-nutritional value, moisture content.
* Cooling techniques
	+ Advantages and disadvantages
* Operation and maintenance of steamer and chiller
* Energy and energy conservation
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |
| 1. Puree steamed sweet potato roots
 | * Introduction to sweet potato puree.
* Importance of puree and its application in baking, pastries, fermented products
* Operations and maintenance of pureeing machine- cleaning, assembly, operation, maintenance
* Puree handling.
	+ Aseptically packaged puree
	+ Frozen puree/ cold chain.
* Puree composition analysis
	+ Brix
	+ vitamins
	+ microbial
	+ PH
	+ Moisture
* Sampling, sample preparation, analysis and results interpretation and reporting
* Energy conservation
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |
| 1. Package sweet potato puree
 | * Functions of packaging
* Types of puree packaging
	+ Vacuum packaging
	+ Aseptic packaging.
* Operation and maintenance of packaging equipment.
* Packaging materials for puree-sterile bags, re-usable cans, plastic bags
* Factors to consider in selection of puree packaging material
* Labeling and coding.
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |
| 1. Store sweet potato puree
 | * Significance of food storage
* Storage methods and conditions.
	+ Cold storage conditions
	+ ambient temperature storage
* Warehouse management
* Tools and equipment for product storage and dispatch
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |
| 1. Dispatch sweet potato puree
 | * Product dispatch procedure
* Documentation-Order processing, Delivery notes
* Logistics management
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Exercises

**List of Recommended Resources**

* Computers
* Projectors
* Flip charts
* Calculators
* Internet

# SWEET POTATO FLOUR

**UNIT CODE:** AGR/CU/SPP/CR/06/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce sweet potato flour

**Duration of Unit:** 100 Hours

**Unit Description**

This unit specifies the competencies required to produce sweet potato flour. It involves procuring sweet potato roots, sorting and grading sweet potato roots, cleaning sweet potato roots, drying sweet potato chips and milling sweet potato chips. It also involves packaging sweet potato flour, storing sweet potato flour and dispatching sweet potato flour.

**Summary of Learning Outcomes**

1. Procure sweet potato roots
2. Sort and grade sweet potato roots
3. Clean sweet potato roots
4. Dry sweet potato chips
5. Mill sweet potato chips
6. Package sweet potato flour
7. Store sweet potato flour
8. Dispatch sweet potato flour

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Procure sweet potato roots
 | * Role and benefits of procurement
* Procurement principles
* Procurement techniques
* Procurement process
* Principles of material handling
* Material handling tools and equipment
 | * Observation
* Oral questions
* Written tests
* Practical tests
* Case study
 |
| 1. Sort and grade sweet potato roots
 | * Difference between sorting and grading
* Significance of sorting and grading
* Sorting and grading tools and equipment
* Sorting and grading methods
 | * Written tests
* Observation
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Clean sweet potato roots
 | * Importance of raw material cleaning
* Raw material contaminants
* Factors determining the choice of a cleaning method
* Cleaning methods
	+ Dry cleaning
	+ Wet cleaning
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Dry sweet potato chips
 | * Significance of peeling
* Peeling methods
* Size reduction and its significance
* Principles of size reduction
* Size reduction tools and equipment
* Size reduction methods
* Importance of drying
* Drying pre-treatments
* Drying tools and equipment
* Drying methods
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercise
 |
| 1. Mill sweet potato chips
 | * Importance of milling
* Types of mills
	+ Hammer
	+ Disc
	+ Roller
* Types of sieves/screens
* Types of mixers
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Package sweet potato flour
 | * Functions of packaging
* Ideal packaging
* Factors influencing choice of a packaging material
* Packaging materials, their advantages and disadvantages
* Types of packaging
	+ Vacuum packing
* Food labeling and coding
 | * Observation
* Written tests
* Oral questions
* Practical tests
 |
| 1. Store sweet potato flour
 | * Significance of food storage
* Storage conditions
	+ Temperature
	+ Humidity
	+ Gas composition
* Tools and equipment for product storage
* Storage methods
* Warehouse management
	+ Inventory control
 | * Observation
* Written tests
* Oral questions
* Practical tests
 |
| 1. Dispatch sweet potato flour
 | * Product dispatch procedures
* Tools and equipment for product dispatch
 | * Written tests
* Oral questions
* Practical tests
* Observation
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Exercises

**List of Recommended Resources**

* Computers
* Projectors
* Flip charts
* Calculators
* Internet

# SWEET POTATO CRISPS

**UNIT CODE:** AGR/CU/SPP/CR/07/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce sweet potato crisps

**Duration of Unit:** 100 Hours

**Unit Description**

This unit specifies the competencies required to produce sweet potato crisps. It involves procuring sweet potato roots, sorting and grading sweet potato roots, cleaning sweet potato roots, preparing sweet potato slices, frying sweet potato slices and seasoning sweet potato crisps. It also involves packaging sweet potato crisps, storing sweet potato crisps and dispatching sweet potato crisps.

**Summary of Learning Outcomes**

1. Procure sweet potato roots
2. Sort and grade sweet potato roots
3. Clean sweet potato roots
4. Prepare sweet potato slices
5. Fry sweet potato slices
6. Season sweet potato slices
7. Package sweet potato crisps
8. Store sweet potato crisps
9. Dispatch sweet potato crisps

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Procure sweet potato roots
 | * Role and benefits of procurement
* Procurement principles
* Procurement techniques
* Procurement process
* Principles of material handling
* Material handling tools and equipment
 | * Observation
* Oral questions
* Written tests
* Practical tests
* Case study
 |
| 1. Sort and grade sweet potato roots
 | * Difference between sorting and grading
* Significance of sorting and grading
* Sorting and grading tools and equipment
* Sorting and grading methods
 | * Written tests
* Observation
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Clean sweet potato roots
 | * Importance of raw material cleaning
* Raw material contaminants
* Factors determining the choice of a cleaning method
* Cleaning methods
	+ Dry cleaning
	+ Wet cleaning
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Prepare sweet potato slices
 | * Significance of peeling
* Peeling methods
* Size reduction and its significance
* Principles of size reduction
* Size reduction tools and equipment
* Size reduction methods
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Fry sweet potato slices
 | * Significance of de - watering
* De - watering tools and equipment
* Pre-drying methods
* Significance of frying
* Frying conditions
	+ Temperature
	+ Time
	+ Oil quality
* Frying tools and equipment
* Frying methods
* De - oiling
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Season sweet potato crisps
 | * Role of seasoning
* Types of seasoning and seasoning ingredients
* Seasoning tools and equipment
* Seasoning methods
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Package sweet potato crisps
 | * Functions of packaging
* Ideal packaging
* Factors influencing choice of a packaging material
* Packaging materials, their advantages and disadvantages
* Types of packaging
	+ Vacuum packing
	+ Inert gas packaging
* Food labeling and coding
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Store sweet potato crisps
 | * Significance of food storage
* Storage conditions
	+ Temperature
	+ Humidity
	+ Gas composition
* Tools and equipment for product storage
* Storage methods
* Warehouse management
	+ Inventory control
 | * Observation
* Written tests
* Oral questions
* Practical tests
 |
| 1. Dispatch sweet potato crisps
 | * Product dispatch procedures
* Tools and equipment for product dispatch
 | * Written tests
* Oral questions
* Practical tests
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Exercises

**List of Recommended Resources**

* Computers
* Projectors
* Flip charts
* Calculators
* Internet

# DRY SWEET POTATO CHIPS

**UNIT CODE:** AGR/CU/SPP/CR/08/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce dry sweet potato chips

**Duration of Unit:** 90 Hours

**Unit Description**

This unit specifies the competencies required to produce dry sweet potato chips. It involves procuring sweet potato roots, sorting and grading sweet potato roots, cleaning sweet potato roots, chipping sweet potato roots and drying sweet potato chips. It also involves packaging sweet potato chips, storing sweet potato chips and dispatching sweet potato chips.

**Summary of Learning Outcomes**

1. Procure sweet potato roots
2. Sort and grade sweet potato roots
3. Clean sweet potato roots
4. Chip sweet potato roots
5. Dry sweet potato chips
6. Package sweet potato chips
7. Store sweet potato chips
8. Dispatch sweet potato chips

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Procure sweet potato roots
 | * Role and benefits of procurement
* Procurement principles
* Procurement techniques
* Procurement process
* Principles of material handling
* Material handling tools and equipment
 | * Observation
* Oral questions
* Written tests
* Practical tests
* Case study
 |
| 1. Sort and grade sweet potato roots
 | * Difference between sorting and grading
* Significance of sorting and grading
* Sorting and grading tools and equipment
* Sorting and grading methods
 | * Written tests
* Observation
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Clean sweet potato roots
 | * Importance of raw material cleaning
* Raw material contaminants
* Factors determining the choice of a cleaning method
* Cleaning methods
* Dry cleaning
* Wet cleaning
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Prepare sweet potato chips
 | * Significance of peeling
* Peeling methods
* Size reduction and its significance
* Principles of size reduction
* Size reduction tools and equipment
* Size reduction methods
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |
| 1. Dry sweet potato chips
 | * Importance of drying
* Drying pre-treatments
* Drying tools and equipment
* Drying methods
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercise
 |
| 1. Package sweet potato chips
 | * Functions of packaging
* Ideal packaging
* Factors influencing choice of a packaging material
* Packaging materials, their advantages and disadvantages
* Food labeling and coding
 | * Observation
* Written tests
* Oral questions
* Practical tests
 |
| 1. Store sweet potato chips
 | * Significance of food storage
* Storage conditions
* Temperature
* Humidity
* Tools and equipment for product storage
* Storage methods
* Warehouse management
* Inventory control
 | * Observation
* Written tests
* Oral questions
* Practical tests
 |
| 1. Dispatch sweet potato chips
 | * Product dispatch procedures
* Tools and equipment for product dispatch
 | * Written tests
* Oral questions
* Practical tests
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Exercises

**List of Recommended Resources**

* Computers
* Projectors
* Flip charts
* Calculators
* Internet

# FOOD SAFETY AND QUALITY ASSURANCE

**UNIT CODE:** AGR/CU/SPP/CR/09/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage food safety and quality assurance

**Duration of Unit:** 100 Hours

**Unit Description**

This unit specifies the competencies required to manage food safety and quality assurance. It involves planning and implementing pre - requisite programmes, establishing HACCP concepts and implementing HACCP plan. It also involves observing food safety legislations and standards and implementing quality assurance programmes.

**Summary of Learning Outcomes**

1. Plan and implement pre – requisite programmes
2. Establish HACCP concepts
3. Implement HACCP plan
4. Observe food safety legislations and standards
5. Implement quality assurance programmes

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Plan and implement pre – requisite programs
 | * Introduction to food safety and quality assurance
* Food hygiene
	+ Food safety
	+ Food suitability
* Good agricultural practice (GAP)
* Good manufacturing practice (GMP)
* Standard operating procedures (SOPs)
 | * Observation
* Oral questions
* Written tests
* Practical tests
* Supervised exercise
 |
| 1. Establish HACCP concepts
 | * Food hazards
	+ Chemical hazards
	+ Biological hazards
	+ Physical hazards
* HACCP principles
 | * Written tests
* Observation
* Oral questioning
* Supervised exercises
 |
| 1. Implement HACCP plan
 | * Advantages of HACCP
* Pre-operational / preliminary phase
* Operational/ implementation phase
* Components of HACCP plan
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Case study
 |
| 1. Observe food safety legislations and standards
 | * Purpose of standards
* Types of standards
	+ Mandatory standards
	+ Voluntary standards
* Kenya standards
	+ KEBS certification
	+ KEPHIS certification
* East African standards
* Global gap standards
* ISO standards
* CODEX standards
* Food legislation and enforcement
* Food regulations
 | * Written tests
* Oral questions
 |
| 1. Implement quality assurance programs
 | * Difference between quality assurance and quality control
* Importance of quality assurance/control
* Raw material and input control
* Process and production control
* Finished product control
* Quality control tools and equipment
 | * Observation
* Written tests
* Oral questions
* Practical tests
* Supervised exercises
 |

**Suggested Methods of Instruction**

* Direct instruction
* Field trips/site visits
* Group discussions
* Demonstration by trainer
* Practice by the trainee
* Exercises

**List of Recommended Resources**

* Computers
* Projectors
* Flip charts
* Calculators
* Internet