**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**FOOD TECHNOLOGIST**

easytvet.com

**LEVEL 6**



TVET CDACC
P.O. BOX 15745-00100
NAIROBI

First published 2018
©2018, TVET CDACC

**Council Secretary/CEO**
**TVET Curriculum Development, Assessment and Certification Council**
**P.O. Box 15745–00100**
**Nairobi, Kenya**
**Email: info@tvetcdacc.go.ke**

# FOREWORD

The provision of quality education and training is fundamental to the Government's overall strategy for socio-economic development. Quality education and training will contribute to achievement of Kenya's development blueprint, Vision 2030 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 of Kenya 2010 and this resulted in the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of 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 these Occupational Standards were developed for the purpose of developing a competency-based curriculum for Food Technology. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for the Food Processing sector's growth and development.

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

# PREFACE

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

The Technical and Vocational Education and Training Act No. 29 of 2013 and Sessional Paper No. 4 of 2016 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET 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.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Food Processing Sector Skills Advisory Committee (SSAC) have developed these Occupational Standards for Food Technologist. These standards will be the basis for development of competency-based curriculum for Food Technology.

The occupational standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Food Processing SSAC, expert workers and all those who participated in the development of these Occupational Standards.


**CHAIRPERSON, TVET CDACC**

# ACKNOWLEDGEMENT

These Occupational Standards were developed through combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) for providing guidance on the development of these Standards. My gratitude goes to Food Processing Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards.

I thank all the individuals and organizations who participated in the validation of these Standards.
I acknowledge all other institutions which in one way or another contributed to the development of these Standards.

**CHAIRPERSON**
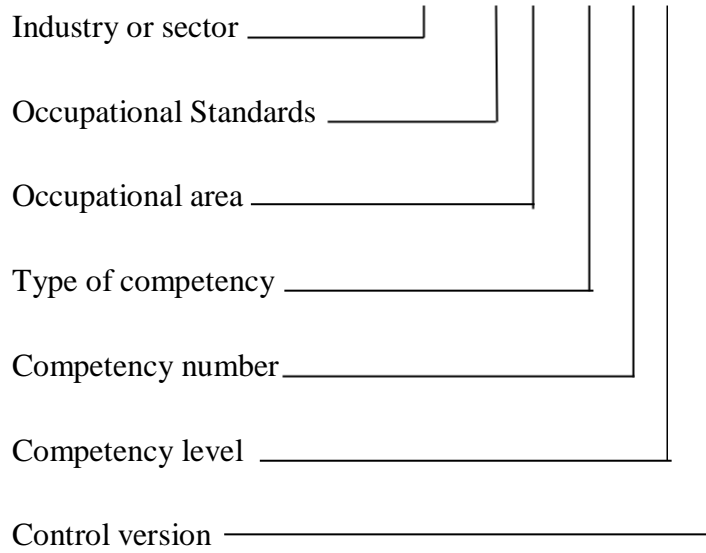**FOOD TECHNOLOGY SECTOR SKILLS ADVISORY COMMITTEE**

# Table of Contents

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AOAC | Association of Official Analytical Chemists |
| BRC | British Retail Consortium |
| CDACC | Curriculum Development, Assessment and Certification Council |
| EMCA | Environmental Management Co-ordination Act |
| EMS | Environmental Management System |
| FSMS | Food Safety Management System |
| GLC | Gas Liquid Chromatograph |
| GLPs | Good Laboratory Practices |
| GMO | Genetically Modified Organism |
| GMPs | Good Manufacturing Practices |
| HACCP | Hazard Analysis Critical Control Point |
| HPLC | High Performance Liquid Chromatograph |
| ICT | Information Communication Technology |
| NEMA | National Environment Management Authority |
| NP | New Product |
| OSH | Occupational Safety and Health |
| PRPs | Pre-Requisite Programs |
| QMS | Quality Management System |
| SOPs | Standard Operating Procedures |
| TVET | Technical and Vocational Education and Training |
| UV | Ultraviolet |

# KEY TO UNIT CODE

## FOP/OS/FT/BC/01/6/A

Industry or sector _____

Occupational Standards _____

Occupational area _____

Type of competency _____

Competency number _____

Competency level _____

Control version _____

# OVERVIEW

Food Technologist Certificate Level 6 qualification consists of competencies that a person must achieve to enable him/her to manage quality of food products, the food processing plant; process food products and develop new food products.

The units of competency leading to Food Technologist Level 6 qualification include the following seven basic and four core competencies:

**Units of Competence**

| Unit Code | Unit Title |
|---|---|
| FOP/OS/FT/BC/01/6/A | Demonstrate communication Skills |
| FOP/OS/FT/BC/02/6/A | Demonstrate numeracy skills |
| FOP/OS/FT/BC/03/6/A | Demonstrate digital literacy |
| FOP/OS/FT/BC/04/6/A | Demonstrate entrepreneurial skills |
| FOP/OS/FT/BC/05/6/A | Demonstrate employability skills |
| FOP/OS/FT/BC/06/6/A | Demonstrate environmental literacy |
| FOP/OS/FT/BC/07/6/A | Demonstrate occupational safety and health practices |

**Core Units of Competence**

| Unit Code | Unit Title |
|---|---|
| FOP/OS/FT/CR/01/6/A | Manage quality of food products |
| FOP/OS/FT/CR/02/6/A | Process food products |
| FOP/OS/FT/CR/03/6/A | Manage food processing plant |
| FOP/OS/FT/CR/04/6/A | Develop new food products |

# BASIC UNITS OF COMPETENCY

# DEMONSTRATE COMMUNICATION SKILLS

**UNIT CODE:** FOP/OS/FT/BC/01/6/A

## UNIT DESCRIPTION

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, developing communication strategies, establishing and maintaining communication pathways, conducting interviews, facilitating group discussion and representing the organization.

## ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| These describe the key outcomes which make up workplace function | These are assessable statements which specify the required level of performance for each of the elements. **_Bold and italicized terms are elaborated in the Range_** |
| 1. Meet communication needs of clients and colleagues | 1.1 Specific communication needs of clients and colleagues are identified and met based on workplace requirements <br><br> 1.2 Different communication approaches are identified and applied according to clients' needs <br><br> 1.3 Conflict is identified and addressed as per the standards of the organization |
| 2. Develop communication strategies | 2.1 Strategies for effective internal and external dissemination of information are developed as per organization's requirements <br><br> 2.2 Special communication needs are considered in developing strategies according workplace procedures <br><br> 2.3 **_Communication strategies_** are analyzed, evaluated and revised based the workplace needs |
| 3. Establish and maintain communication pathways | 3.1 Pathways of communication are established as per organization policy <br><br> 3.2 Pathways are maintained and reviewed according to organization procedures |
| 4. Promote use of communication strategies | 4.1 Information is provided to all areas of the organization as per strategy requirements <br><br> 4.2 Effective communication techniques are articulated and modeled according work requirements <br><br> 4.3 Personnel are given guidance about adapting communication |

| | strategies as per organization procedures |
|---|---|
| 5. Conduct interview | 5.1 A range of appropriate communication strategies are employed in *interview situations* based on the workplace requirements |
| | 5.2 Records of interviews are made and maintained in accordance with organizational procedures |
| | 5.3 Effective questioning, listening and nonverbal communication techniques are used as per needs |
| 6. Facilitate group discussion | 6.1 Mechanisms to enhance *effective group interaction* are identified and implemented according to workplace requirements |
| | 6.2 Strategies to encourage group participation are identified and used as per organizations' procedures |
| | 6.3 Meetings objectives and agenda are set and followed based on workplace requirements |
| | 6.4 Relevant information is provided and feedback obtained according to set protocols |
| | 6.5 Evaluation of group communication strategies is undertaken in accordance with workplace guidelines |
| | 6.6 Specific communication needs of individuals are identified and addressed as per individual needs |
| 7. Represent the organization | 5.1 7Relevant presentation are researched and presented based on internal or external communication forums requirements |
| | 5.2 Presentation is delivered in a clear and sequential manner as per the predetermined time |
| | 5.3 Presentation is made as per appropriate media |
| | 5.4 Difference views are respected based on workplace procedures |
| | 5.5 Written communication is done as per organizational standards |
| | 5.6 Inquiries are responded according to organizational standard |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

| Variable | Range |
|---|---|
| *1.* Communication strategies may include but not limited to: | • Language switch<br><br>• Comprehension check<br><br>• Repetition<br><br>• Asking confirmation<br><br>• Paraphrase<br><br>• Clarification request<br><br>• Translation<br><br>• Restructuring<br><br>• Approximation<br><br>• Generalization |
| 2. Effective group interaction may include but not limited to: | • Identifying and evaluating what is occurring within an interaction in a nonjudgmental way<br><br>• Using active listening<br><br>• Making decision about appropriate words, behavior<br><br>• Putting together response which is culturally appropriate<br><br>• Expressing an individual perspective<br><br>• Expressing own philosophy, ideology and background and exploring impact with relevance to communication |
| 3. Situations may include but not limited to: | • Establishing rapport<br><br>• Eliciting facts and information<br><br>• Facilitating resolution of issues<br><br>• Developing action plans<br><br>• Diffusing potentially difficult situations |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

- Communication
- Active listening
- Interpretation
- Negotiation
- Writing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

- Communication process
- Dynamics of groups
- Styles of group leadership
- Key elements of communications strategy

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:<br>1.1 Developed communication strategies to meet the organization requirements and applied in the workplace<br><br>1.2 Established and maintained communication pathways for effective communication in the workplace<br><br>1.3 Used communication strategies involving exchanges of complex oral information |
|---|---|
| 2. Resource Implications | The following resources should be provided:<br>2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place<br><br>2.2 Materials relevant to the proposed activity or tasks |
| 3. Methods of Assessment | Competency in this unit may be assessed through:<br>3.1     Direct observation<br><br>3.2     Oral questioning<br><br>3.3     Written texts |
| 4. Context of | Competency may be assessed: |

| | Assessment | 4.1 On-the-job |
|---|---|---|
| | | 4.2 Off-the –job |
| | | 4.3    During Industrial attachment |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE NUMERACY SKILLS

**UNIT CODE:** FOP/OS/FT/BC/02/6/A

## UNIT DESCRIPTION

This unit describes the competencies required to demonstrate numeracy skills. It involves; applying a wide range of mathematical calculations for work; applying ratios, rates and proportions to solve problems; estimating, measuring and calculating measurement for work; using detailed maps to plan travel routes for work; using geometry to draw and construct 2D and 3D shapes for work; collecting, organizing and interpreting statistical data; using routine formula and algebraic expressions for work and using common functions of a scientific calculator.

## ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| These describe the key outcomes which make up workplace function. | These are assessable statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in the Range.*** |
| 1. Apply a wide range of mathematical calculations for work | 1.1 Mathematical information embedded in a range of workplace tasks and texts is extracted as per workplace procedures. |
| | 1.2 Mathematical information is interpreted and comprehended as per job specifications |
| | 1.3 A range of mathematical and problem solving processes are selected and used as per job specification |
| | 1.4 Different forms of fractions, decimals and percentages are flexibly used as per SOPs |
| | 1.5 Calculation performed with positive and negative numbers as per SOPs |
| | 1.6 Numbers are expressed as powers and roots and are used in calculations as per SOPs |
| | 1.7 Calculations done using routine formulas as per SOPs |
| | 1.8 Estimation and assessment processes are used to check outcome as per workplace procedures |
| | 1.9 Mathematical language is used to discuss and explain the processes, results and implications of the task as per workplace procedures |

| | | |
|---|---|---|
| 2. Use and apply ratios, rates and proportions for work | 2.1 | Information regarding ratios, rates and proportions extracted from a range of workplace tasks and texts as per SOPs |
| | 2.2 | Mathematical information related to ratios, rate and proportions is analysed as per SOPs |
| | 2.3 | Problem solving processes are used to undertake the task as per workplace procedures |
| | 2.4 | Equivalent ratios and rates are simplified as per SOPs |
| | 2.5 | Quantities are calculated using ratios, rates and proportions as per SOPS |
| | 2.6 | Graphs, charts or tables are constructed to represent ratios, rates and proportions as per SOPs |
| | 2.7 | The outcomes reviewed and checked as per job specifications |
| | 2.8 | Information is record using mathematical language and symbols as per workplace procedures |
| 3. Estimate, measure and calculate measurement for work | 3.1 | Measurement information embedded in workplace texts and tasks are extracted and interpreted as per job specifications |
| | 3.2 | Appropriate workplace measuring equipment are identified and selected as per job specifications |
| | 3.3 | Accurate measurements are estimated and made as per SOPs |
| | 3.4 | The area of *2D shapes* including compound shapes are calculated as per SOPs |
| | 3.5 | The volume of 3D shapes is calculated using relevant formulas as per SOPs |
| | 3.6 | Sides of right angled triangles are calculated using Pythagoras' theorem as per SOPs |
| | 3.7 | conversions are perform between units of measurement as per job specification |
| | 3.8 | Problem solving processes are used to undertake the task as per workplace Procedures |

| | | 3.9 The measurement outcomes are reviewed and checked as per workplace procedures |
|---|---|---|
| | | 3.10 Information is recorded using mathematical language and symbols appropriate for the task as per workplace procedures |
| 4. | Use detailed maps to plan travel routes for work | 4.1 Different types of maps are identified and interpreted as per job requirements |
| | | 4.2 Key features of maps are identified as per job requirements |
| | | 4.3 Scales are identified and interpreted as per job requirements |
| | | 4.4 Scales are applied to calculate actual distances |
| | | 4.5 Positions or locations are determined using directional information as per job requirements |
| | | 4.6 Routes are planned by determining directions and calculating distances, speeds and times as per job requirements |
| | | 4.7 Information is gathered and identified and relevant factors related to planning a route checked as per job requirements |
| | | 4.8 Relevant equipment is select and checked for accuracy and operational effectiveness as per job requirements |
| | | 4.9 Task is planned and recorded using specialized mathematical language and symbols appropriate for the task as per job requirements |
| 5. | Use geometry to draw 2D shapes and construct 3D shapes for work | 5.1 A range of 2D shapes and 3D shapes and their uses in work contexts is identified as per job specifications |
| | | 5.2 Features of 2D and 3D shapes are named and described as per job specifications |
| | | 5.3 Types of angles in 2D and 3D shapes are identified as per job specifications |
| | | 5.4 Angles are drawn, estimated and measured using geometric instruments as per job requirements |
| | | 5.5 Angle properties of 2D shapes are named and identified |

| | | as per SOPs |
|---|---|---|
| | | 5.6 Angle properties are used to evaluate unknown angles in shapes as per SOPs |
| | | 5.7 Properties of perpendicular and parallel lines are applied to shapes as per SOPs |
| | | 5.8 Understanding and use of symmetry is demonstrated as per SOPs |
| | | 5.9 Understanding and use of similarity is demonstrated as per SOPs |
| | | 5.10 The workplace tasks and mathematical processes required are identified as per workplace procedures |
| | | 5.11 2D shapes is drawn for work as per job specification |
| | | 5.12 3D shapes is constructed for work as per job specification |
| | | 5.13 The outcomes are reviewed and checked as per workplace procedures |
| | | 5.14 Specialized mathematical language and symbols appropriate for the task are used as per SOPs |
| 6. Collect, organize, and interpret statistical data for work | | 6.1 Workplace issue requiring investigation are identified as per workplace procedures |
| | | 6.2 Audience / population / sample unit is determined as per workplace procedures as per workplace procedures |
| | | 6.3 Data to be collected is identified as per workplace procedures |
| | | 6.4 Data collection method is selected as per workplace procedures |
| | | 6.5 Appropriate statistical data is collected and organized as per SOPs |
| | | 6.6 Data is illustrated in appropriate formats as per SOPs |
| | | 6.7 The effectiveness of different types of graphs are compared as per SOPs |
| | | 6.8 The summary statistics for collected data is calculated as per SOPs |

| | 6.9 The results / findings are interpreted as per SOPs |
|---|---|
| | 6.10 Data is checked to ensure that it meets the expected results and content as per workplace procedures |
| | 6.11 Information from the results including tables, graphs and summary statistics is extracted and interpreted as per workplace procedure |
| | 6.12 Mathematical language and symbols are used to report results of investigation as per workplace procedure |
| 7. Use routine formula and algebraic expressions for work | 7.1 Understanding of informal and symbolic notation, representation and conventions of algebraic expressions is demonstrated as per SOPs |
| | 7.2 Simple algebraic expressions and equations are developed as per job specification |
| | 7.3 Operate on algebraic expressions as per job requirement |
| | 7.4 Algebraic expressions are simplified as per job requirement |
| | 7.5 Substitution into simple routine equations is done as per SOPs |
| | 7.6 Routine formulas used for work tasks are identified and comprehended as per SOPs |
| | 7.7 Routine formulas are evaluate by substitution as per SOPs |
| | 7.8 Routine formulas transposed as per SOPs |
| | 7.9 Appropriate formulas are identified and used for work related tasks as per workplace procedures |
| | 7.10 Outcomes are checked and result of calculation used as per workplace procedures |
| 8. Use common functions of a scientific calculator for work | 8.1 Required numerical information to perform tasks is located as per job specification |
| | 8.2 The order of operations and function keys necessary to solve mathematical calculation are determined as per job specification |
| | 8.3 Function keys on a scientific calculator are identified and |

used as per SOPs

8.4 Estimations are referred to check reasonableness of problem solving process as per workplace procedures

8.5 Appropriate mathematical language, symbols and conventions are used to report results as per workplace procedures

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. 2D shapes may include but not limited may include but not limited to: | • Triangles<br>• Square<br>• Rectangle<br>• Triangle |

## REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit of competency.

### Required Skills
The individual needs to demonstrate the following skills:
- Measuring
- Logical thinking
- Computing
- Drawing of graphs
- Applying mathematical formulas
- Analytical

### Required knowledge
The individual needs to demonstrate knowledge of:
- Types of common shapes

- Differentiation between two dimensional shapes / objects

- Formulae for calculating area and volume

- Types and purpose of measuring instruments

- Units of measurement and abbreviations

- Fundamental operations (addition, subtraction, division, multiplication)

- Rounding techniques

- Types of fractions

- Different types of tables and graphs

- Meaning of graphs, such as increasing, decreasing, and constant value

- Preparation of basic data, tables & graphs


**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:<br>1. 1  Developed communication strategies to meet the organization requirements and applied in the workplace<br><br>1. 2  Established and maintained communication pathways for effective communication in the workplace<br><br>1. 3  Used communication strategies involving exchanges of complex oral information |
|---|---|
| 2. Resource Implications | The following resources should be provided:<br>2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place<br><br>2.2 Materials relevant to the proposed activity or tasks |
| 3. Methods of Assessment | Competency in this unit may be assessed through:<br>3.1 Observation<br><br>3.2 Oral questioning<br><br>3.3 Written test |

|   |   |
|---|---|
|   | 3.4 Portfolio of Evidence |
|   | 3.5 Interview |
|   | 3.6 Third party report |
| 4. Context of Assessment | Competency may be assessed:<br>4.1 On-the-job<br><br>4.2 Off-the –job<br><br>4.3 During Industrial attachment |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**UNIT CODE:** FOP/OS/FT/BC/03/6/A

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT<br><br>These describe the key outcomes which make up workplace function | PERFORMANCE CRITERIA<br><br>These are assessable statements which specify the required level of performance for each of the elements.<br><br>*Bold and italicized terms are elaborated in the Range* |
|---|---|
| 1. Identify appropriate computer software and hardware | 1.1 Concepts of ICT are determined in accordance with computer equipment<br><br>1.2 Classifications of computers are determined in accordance with manufacturers specification<br><br>1.3 Appropriate computer software is identified according to manufacturer's specification<br><br>1.4 Appropriate computer hardware is identified according to manufacturer's specification<br><br>1.5 Functions and commands of operating system are determined in accordance with manufacturer's specification |
| 2. Apply security measures to data, hardware, software in automated environment | 2.1 *Data security and privacy are classified* in accordance with the prevailing technology<br><br>2.2 *Security threats* reidentified *and control measures* are applied in accordance with laws governing protection of ICT<br><br>2.3 Computer threats and crimes are detected in accordance to Information Management security guidelines<br><br>2.4 Protection against computer crimes is undertaken in accordance with laws governing protection of ICT |
| 3. Apply computer | 3.1 *Word processing concepts* are applied in resolving workplace |

| | software in solving tasks | tasks, report writing and documentation as per the job requirements |
|---|---|---|
| | | 3.2 *Word processing utilities* are applied in accordance with workplace procedures |
| | | 3.3 Worksheet layout is prepared in accordance with work procedures |
| | | 3.4 Worksheet is built and data manipulated in the worksheet in accordance with workplace procedures |
| | | 3.5 Continuous data manipulated on worksheet is undertaken in accordance with work requirements |
| | | 3.6 Database design and manipulation is undertaken in accordance with office procedures |
| | | 3.7 Data sorting, indexing, storage, retrieval and security is provided in accordance with workplace procedures |
| 4. | Apply internet and email in communication at workplace | 4.1 Electronic mail addresses are opened and applied in workplace communication in accordance with office policy |
| | | 4.2 Office internet functions are defined and executed in accordance with office procedures |
| | | 4.3 *Network configuration* is determined in accordance with office operations procedures |
| | | 4.4 Official World Wide Web is installed and managed according to workplace procedures |
| 5. | Apply Desktop publishing in official assignments | 5.1 Desktop publishing functions and tools are identified in accordance with manufactures specifications |
| | | 5.2 Desktop publishing tools are developed in accordance with work requirements |
| | | 5.3 Desktop publishing tools are applied in accordance with workplace requirements |
| | | 5.4 Typeset work is enhanced in accordance with workplace standards |
| 6. | Prepare presentation packages | 6.1 Types of presentation packages are identified in accordance with office requirements |
| | | 6.2 Slides are created and formulated in accordance with |

| | workplace procedures |
| --- | --- |
| | 6.3 Slides are edited and run-in accordance with work procedures |
| | 6.4 Slides and handouts are printed according to work requirements |

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
| --- | --- |
| 1. Appropriate computer hardware may include but not limited to: | Collection of physical parts of a computer system such as:<br>• Computer case, monitor, keyboard, and mouse<br>• All the parts inside the computer case, such as the hard disk drive, motherboard and video card |
| 2. Data security and privacy may include but not limited to: | • Confidentiality of data<br>• Cloud computing<br>• Integrity -but-curious data surfing |
| 3. Security and control measures may include but not limited to: | • Counter measures against cyber terrorism<br>• Risk reduction<br>• Cyber threat issues<br>• Risk management<br>• Pass-wording |
| 4. Security threats may include but not limited to: | • Cyber terrorism<br>• Hacking |

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:
• Analytical skills

- Interpretation

- Typing

- Communication

- Computing (applying fundamental operations such as addition, subtraction, division and multiplication)

- Using calculator

- Basic ICT skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:
- Software concept

- Functions of computer software and hardware

- Data security and privacy

- Computer security threats and control measures

- Technology underlying cyber-attacks and networks

- Cyber terrorism

- Computer crimes

- Detection and protection of computer crimes

- Laws governing protection of ICT

- Word processing;

  - Functions and concepts of word processing.

  - Documents and tables creation and manipulations

  - Mail merging

  - Word processing utilities

- Spread sheets;

  - Meaning, formulae, function and charts, uses and layout

  - Data formulation, manipulation and application to cells

- Database;

  - Database design, data manipulation, sorting, indexing, storage retrieval and security

- Desktop publishing;

  - Designing and developing desktop publishing tools

  - Manipulation of desktop publishing tools

  - Enhancement of typeset work and printing documents

- Presentation Packages;

  - Types of presentation Packages

  - Creating, formulating, running, editing, printing and presenting slides and handouts

- Networking and Internet;

  - Computer networking and internet.

  - Electronic mail and world wide web

- Emerging trends and issues in ICT;

  - Identify and integrate emerging trends and issues in ICT

  - Challenges posed by emerging trends and issues

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: |
|---|---|
| | 1.1    Identified and controlled security threats |
| | 1.2    Detected and protected computer crimes |
| | 1.3    Applied word processing in office tasks |
| | 1.4    Designed, prepared work sheet and applied data to the cells in accordance to workplace procedures |
| | 1.5    Opened electronic mail for office communication as per workplace procedure |
| | 1.6    Installed internet and World Wide Web for office tasks in |

| | | |
|---|---|---|
| | | accordance with office procedures |
| | | 1.7      Integrated emerging issues in computer ICT applications |
| | | 1.8      Applied laws governing protection of ICT |
| 2. | Resource Implications | The following resources should be provided: <br> 2.1   Access to relevant workplace where assessment can take place <br><br> 2.2   Appropriately simulated environment where assessment can take place |
| 3. | Methods of Assessment | Competency may be assessed through: <br> 3.1   Observation <br><br> 3.2   Oral questioning <br><br> 3.3   Written test <br><br> 3.4   Portfolio of Evidence <br><br> 3.5   Interview <br><br> 3.6   Third party report |
| 4. | Context of Assessment | Competency may be assessed: <br> 4.1 On-the-job <br><br> 4.2 Off-the –job <br><br> 4.3 During Industrial attachment |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE ENTREPRENEURIAL SKILLS

**UNIT CODE :** FOP/OS/FT/BC/04/6/A

## UNIT DESCRIPTION

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

## ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| 1. Demonstrate understanding of an entrepreneur | 1. 1 Entrepreneurs and Business persons are distinguished as per principles of entrepreneurship<br><br>1. 2 *Types of entrepreneurs* are identified as per principles of entrepreneurship<br><br>1. 3 Ways of becoming an entrepreneur are identified as per principles of Entrepreneurship<br><br>1. 4 *Characteristics of Entrepreneurs* are identified as per principles of Entrepreneurship<br><br>1. 5 Factors affecting Entrepreneurship development are explored as per principles of Entrepreneurship |
| 2. Demonstrate understanding of Entrepreneurship and self-employment | 2. 1 Entrepreneurship and self-employment are distinguished as per principles of entrepreneurship<br><br>2. 2 Importance of self-employment is analysed based on business procedures and strategies<br><br>2. 3 *Requirements for entry into self-employment* are identified according to business procedures and strategies<br><br>2. 4 Role of an Entrepreneur in business is determined according to business procedures and strategies<br><br>2. 5 Contributions of Entrepreneurs to National development are identified as per business procedures and strategies<br><br>2. 6 Entrepreneurship culture in Kenya is explored as |

| | | per business procedures and strategies |
|---|---|---|
| | 2.7 | Born or made Entrepreneurs are distinguished as per entrepreneurial traits |
| 3. Identify Entrepreneurship opportunities | 3.1 | Sources of business ideas are identified as per business procedures and strategies |
| | 3.2 | Business ideas and opportunities are generated as per business procedures and strategies |
| | 3.3 | Business life cycle is analysed as per business procedures and strategies |
| | 3.4 | Legal aspects of business are identified as per procedures and strategies |
| | 3.5 | Product demand is assessed as per market strategies |
| | 3.6 | Types of *business environment* are identified and evaluated as per business procedures |
| | 3.7 | Factors to consider when evaluating business environment are explored based on business procedure and strategies |
| | 3.8 | Technology in business is incorporated as per best practice |
| 4. Create entrepreneurial awareness | 4.1 | *Forms of businesses* are explored as per business procedures and strategies |
| | 4.2 | Sources of business finance are identified as per business procedures and strategies |
| | 4.3 | Factors in selecting source of business finance are identified as per business procedures and strategies |
| | 4.4 | *Governing policies* on Small Scale Eenterprises (SSEs) are determined as per business procedures and strategies |
| | 4.5 | Problems of starting and operating SSEs are explored as per business procedures and strategies |
| 5. Apply entrepreneurial motivation | 5.1 | *Internal and external motivation* factors are determined in accordance with motivational theories |
| | 5.2 | Self-assessment is carried out as per entrepreneurial |

| | | |
|---|---|---|
| | | orientation |
| | 5.3 | Effective communications are carried out in accordance with communication principles |
| | 5.4 | Entrepreneurial motivation is applied as per motivational theories |
| 6. Develop innovative business strategies | 6.1 | Business innovation strategies are determined in accordance with the organization strategies |
| | 6.2 | Creativity in business development is demonstrated in accordance with business strategies |
| | 6.3 | *Innovative business strategies* are developed as per business principles |
| | 6.4 | Linkages with other entrepreneurs are created as per best practice |
| | 6.5 | ICT is incorporated in business growth and development as per best practice |
| 7. Develop Business Plan | 7.1 | Identified Business is described as per business procedures and strategies |
| | 7.2 | Marketing plan is developed as per business plan format |
| | 7.3 | Organizational/Management plan is prepared in accordance with business plan format |
| | 7.4 | Production/operation plan in accordance with business plan format |
| | 7.5 | Financial plan is prepared in accordance with the business plan format |
| | 7.6 | Executive summary is prepared in accordance with business plan format |
| | 7.7 | Business plan is presented as per best practice |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. Types of entrepreneurs may include but not limited to: | • Innovators<br>• Imitators<br>• Craft<br>• Opportunistic<br>• Speculators |
| 2. Characteristics of Entrepreneurs may include but not limited to: | • Creative<br>• Innovative<br>• Planner<br>• Risk taker<br>• Networker<br>• Confident<br>• Flexible<br>• Persistent<br>• Patient<br>• Independent<br>• Future oriented<br>• Goal oriented |
| 3. Requirements for entry into self-employment may include but not limited to | • Technical skills<br>• Management skills<br>• Entrepreneurial skills<br>• Resources<br>• Infrastructure |

| 4. Internal and external motivation may include but not limited to: | • Interest<br><br>• Passion<br><br>• Freedom<br><br>• Prestige<br><br>• Rewards<br><br>• Punishment<br><br>• Enabling environment<br><br>• Government policies |
|---|---|
| 5. Business environment may include but not limited to: | • External<br><br>• Internal<br><br>• Intermediate |
| 6. Forms of businesses may include but not limited to: | • Sole proprietorship<br><br>• Partnership<br><br>• Limited companies<br><br>• Cooperatives |
| 7. Governing policies may include but not limited to: | • Increasing scope for finance<br><br>• Promoting cooperation between entrepreneurs and private sector<br><br>• Reducing regulatory burden on entrepreneurs<br><br>• Developing IT tools for entrepreneurs |
| 8. Innovative business strategies may include but not limited to: | • New products<br><br>• New methods of production<br><br>• New markets<br><br>• New sources of supplies<br><br>• Change in industrialization |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

- Analytical
- Management
- Problem-solving
- Root-cause analysis
- Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

- Decision making
- Business communication
- Change management
- Competition
- Risk
- Net working
- Time management
- Leadership
- Factors affecting entrepreneurship development
- Principles of Entrepreneurship
- Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
- Conflict resolution
- Health, safety and environment (HSE) principles and requirements
- Customer care strategies
- Basic financial management
- Business strategic planning
- Impact of change on individuals, groups and industries
- Government and regulatory processes
- Local and international market trends
- Product promotion strategies
- Market and feasibility studies
- Government and regulatory processes
- Local and international business environment
- Relevant developments in other industries
- Regional/ County business expansion strategies

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | 1. 1 Assessment requires evidence that the candidate: |
|---|---|
| | 1. 2 Distinguished entrepreneurs and businesspersons correctly |
| | 1. 3 Identified ways of becoming an entrepreneur appropriately |
| | 1. 4 Explored factors affecting entrepreneurship development appropriately |
| | 1. 5 Analysed importance of self-employment accurately |
| | 1. 6 Identified requirements for entry into self-employment correctly |
| | 1. 7 Identified sources of business ideas correctly |
| | 1. 8 Generated Business ideas and opportunities correctly |
| | 1. 9 Analysed business life cycle accurately |
| | 1. 10 Identified legal aspects of business correctly |
| | 1. 11 Assessed product demand accurately |
| | 1. 12 Determined Internal and external motivation factors appropriately |
| | 1. 13 Carried out communications effectively |
| | 1. 14 Identified sources of business finance correctly |
| | 1. 15 Determined Governing policy on small scale enterprise appropriately |
| | 1. 16 Explored problems of starting and operating SSEs effectively |
| | 1. 17 Developed Marketing, Organizational/Management, Production/Operation and Financial plans correctly |
| | 1. 18 Prepared executive summary correctly |
| | 1. 19 Determined business innovative strategies appropriately |

| | | 1. 20     Presented business plan effectively |
|---|---|---|
| 2. | Resource Implications | The following resources should be provided:<br>2.1     Access to relevant workplace where assessment can take place<br><br>2.2     Appropriately simulated environment where assessment can take place |
| 3. | Methods of Assessment | 3.1     Written tests<br><br>3.2     Oral questions<br><br>3.3     Third party report<br><br>3.4     Interviews<br><br>3.5     Portfolio of Evidence |
| 4. | Context of Assessment | Competency may be assessed<br>4.1     On-the-job<br><br>4.2     Off-the –job<br><br>4.3     During Industrial attachment |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE EMPLOYABILITY SKILLS

**UNIT CODE:** FOP/OS/FT/BC/05/6/A

**UNIT DESCRIPTON**

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 ethical performance.

## ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| These describe the key outcomes which make up workplace function. | These are assessable statements which specify the required level of performance for each of the elements. *Bold and italicized terms are elaborated in the Range* |
| 1. Conduct self-management | 1.1 Personal vision, mission and goals are formulated based on potential and in relation to organization objectives<br><br>1.2 Emotional intelligence is demonstrated as per workplace requirements.<br><br>1.3 Individual performance is evaluated and monitored according to the agreed targets.<br><br>1.4 Assertiveness is developed and maintained based on the requirements of the job.<br><br>1.5 Accountability and responsibility for own actions are demonstrated based on workplace instructions.<br><br>1.6 Self-esteem and a positive self-image are developed and maintained based on values.<br><br>1.7 Time management, attendance and punctuality are observed as per the organization policy.<br><br>1.8 Goals are managed as per the organization's objective<br><br>1.9 Self-strengths and weaknesses are identified based on personal objectives |
| 2. Demonstrate | 2.1 Writing skills are demonstrated as per communication |

| | | policy |
|---|---|---|
| | interpersonal communication | 2.2 Negotiation and persuasion skills are demonstrated as per communication policy |
| | | 2.3 Internal and external stakeholders' needs are identified and interpreted as per the communication policy |
| | | 2.4 Communication networks are established based on workplace policy |
| | | 2.5 Information is shared as per communication policy |
| 3. | Demonstrate critical safe work habits | 3.1 Stress is managed in accordance with workplace policy. |
| | | 3.2 Punctuality and time consciousness is demonstrated in line with workplace policy. |
| | | 3.3 Personal objectives are integrated with organization goals based on organization's strategic plan. |
| | | 3.4 *Resources* are utilized in accordance with workplace policy. |
| | | 3.5 Work priorities are set in accordance to workplace goals and objectives. |
| | | 3.6 Leisure time is recognized and utilized in line with personal objectives. |
| | | 3.7 *Drugs and substances of abuse* are identified and avoided based on workplace policy. |
| | | 3.8 HIV and AIDS prevention awareness is demonstrated in line with workplace policy. |
| | | 3.9 Safety consciousness is demonstrated in the workplace based on organization safety policy. |
| | | 3.10 *Emerging issues* are identified and dealt with in accordance with organization policy. |
| 4. | Lead a workplace team | 4.1 Performance targets for the *team* are set based on organization's objectives |
| | | 4.2 Duties are assigned in accordance with the organization policy. |

| | | |
|---|---|---|
| | | 4.3 *Forms of communication* in a team are established according to organization's policy. |
| | | 4.4 Team performance is evaluated based on set targets as per workplace policy. |
| | | 4.5 Conflicts are resolved between team members in line with organization policy. |
| | | 4.6 Gender related issues are identified and mainstreamed in accordance workplace policy. |
| | | 4.7 Human rights and fundamental freedoms are identified and respected as Constitution of Kenya 2010. |
| | | 4.8 Healthy relationships are developed and maintained in line with workplace. |
| 5. | Plan and organize work | 5.1 Work plans are prepared based on activities and budget. |
| | | 5.2 Assigned tasks are interpreted and expectations identified as per the workplace instructions. |
| | | 5.3 Task occupational safety and health requirements are identified and observed regulations. |
| | | 5.4 Work resources are identified, mobilized, allocated and utilized based on organization work plans. |
| | | 5.5 Work activities are monitored and evaluated in line with work plans and workplace policy. |
| | | 5.6 Work plans are reviewed based on target and available resources. |
| 6. | Maintain professional growth and development | 6.1 Personal training needs are identified and assessed in line with the requirements of the job. |
| | | 6.2 *Training and career opportunities* are identified and utilized based on job requirements. |
| | | 6.3 Resources for training are mobilized and allocated based organizations and individual skills needs. |
| | | 6.4 Licensees and certifications relevant to job and career are obtained and renewed as per policy. |
| | | 6.5 Work priorities and personal commitments are balanced and managed based on requirements of the job and |

| | | personal objectives. |
|---|---|---|
| | | 6.6 Recognitions are sought as proof of career advancement in line with professional requirements. |
| 7. Demonstrate workplace learning | | 7.1 Learning opportunities are sought and managed based on job requirement and organization policy. |
| | | 7.2 Improvement in performance is demonstrated based on courses attended. |
| | | 7.3 Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job |
| | | 7.4 Time and effort is invested in learning new skills based on job requirements |
| | | 7.5 Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy. |
| | | 7.6 New systems are developed and maintained in accordance with the requirements of the job. |
| | | 7.7 Awareness of personal role in workplace *innovation* is demonstrated based on requirements of the job. |
| 8. Demonstrate problem solving skills | | 8.1 Creative, innovative and practical solutions are developed based on the problem |
| | | 8.2 Independence and initiative in identifying and solving problems is demonstrated based on requirements of the job. |
| | | 8.3 Team problems are solved as per the workplace guidelines |
| | | 8.4 Problem solving strategies are applied as per the workplace guidelines |
| | | 8.5 Problems are analyzed and assumptions tested as per the context of data and circumstances |
| 9. Manage ethical performance | | 9.1 Policies and guidelines are observed as per the workplace requirements |
| | | 9.2 Self-worth and professionalism is exercised in line with personal goals and organizational policies |
| | | 9.3 Code of conduct is observed as per the workplace requirements |

| | 9.4 Integrity is demonstrated as per legal requirement |
|---|---|

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. Drug and substance abuse may include but not limited to: | Commonly abused<br>• Alcohol<br><br>• Tobacco<br><br>• Miraa<br><br>• Over-the-counter drugs<br><br>• Cocaine<br><br>• Bhang<br><br>• Glue |
| 2. Feedback may include but not limited to: | • Verbal<br><br>• Written<br><br>• Informal<br><br>• Formal |
| 3. Relationships may include but not limited to: | • Man/Woman<br><br>• Trainer/trainee<br><br>• Employee/employer<br><br>• Client/service provider<br><br>• Husband/wife<br><br>• Boy/girl<br><br>• Parent/child<br><br>• Sibling relationships |

| | |
|---|---|
| 4. Forms of communication may include but not limited to: | • Written<br>• Visual<br>• Verbal<br>• Non verbal<br>• Formal and informal |
| 5. Team may include but not limited to: | • Small work group<br>• Staff in a section/department<br>• Inter-agency group |
| 6. Personal growth may include but not limited to: | • Growth in the job<br>• Career mobility<br>• Gains and exposure the job gives<br>• Net workings<br>• Benefits that accrue to the individual as a result of noteworthy performance |
| 7. Personal objectives may include but not limited to: | • Long term<br>• Short term<br>• Broad<br>• Specific |
| 8. Trainings and career opportunities may includes but not limited to | • Participation in training programs<br>• Serving as Resource Persons in conferences and workshops |
| 9. Resource may include may but not limited to: | • Human<br>• Financial<br>• Technology |
| 10. Innovation may include but not limited to: | • New ideas<br>• Original ideas |

| | |
|---|---|
| | • Different ideas |
| | • Methods/procedures |
| | • Processes |
| | • New tools |
| 11. Emerging issues may include but not limited to: | • Terrorism |
| | • Social media |
| | • National cohesion |
| | • Open offices |
| 12. Range of media for learning may include but not limited to: | • Mentoring |
| | • peer support and networking |
| | • IT and courses |

## REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit of competency.

### Required Skills
The individual needs to demonstrate the following skills:
- Interpersonal
- Communication
- Critical thinking
- Organizational
- Negotiation
- Monitoring
- Evaluation
- Record keeping
- Problem solving
- Decision Making
- Resource utilization
- Resource mobilization

### Required Knowledge
The individual needs to demonstrate knowledge of:
- Work values and ethics
- Company policies
- Company operations, procedures and standards

- Occupational Health and safety procedures
- Fundamental rights at work
- Workplace communication
- Concept of time
- Time management
- Decision making
- Types of resources
- Work planning
- Organizing work
- Monitoring and evaluation
- Record keeping
- Gender mainstreaming
- HIV and AIDS
- Drug and substance abuse
- Professional growth and development
- Technology in the workplace
- Innovation
- Emerging issues

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:<br>1.1 Conducted self-management<br><br>1.2 Demonstrated interpersonal communication<br><br>1.3 Demonstrated critical safe work habits<br><br>1.4 Demonstrated the ability to lead a workplace team<br><br>1.5 Planned and organized work<br><br>1.6 Maintained professional growth and development<br><br>1.7 Demonstrated workplace learning<br><br>1.8 Demonstrated problem solving skills<br><br>1.9 Demonstrated the ability to manage performance ethically |
|---|---|
| 2. Resource Implications | The following resources should be provided:<br>  2.1 Access to relevant workplace where assessment can |

| | | take place |
|---|---|---|
| | | 2.2 Appropriately simulated environment where assessment can take place |
| 3. | Methods of Assessment | Competency in this unit may be assessed through:<br><br>3.1 Observation<br><br>3.2 Oral questioning<br><br>3.3 Written test<br><br>3.4 Portfolio of Evidence<br><br>3.5 Interview<br><br>3.6 Third party report |
| 4. | Context of Assessment | Competency may be assessed:<br><br>4.1 On-the-job<br><br>4.2 Off-the –job<br><br>4.3 During Industrial attachment |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE ENVIRONMENTAL LITERACY

**UNIT CODE:** FOP/OS/FT/BC/06/6/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to demonstrate environmental literacy. It involves, controlling environmental hazard and environmental pollution, demonstrating sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs, monitoring activities on environmental protection/Programs, analyzing resource use and developing resource conservation plans

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT  These describe the key outcomes which make up workplace function. | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements.  *Bold and italicized terms are elaborated in the Range* |
|---|---|
| 1. Control environmental hazard | 1. 1 Storage methods for environmentally hazardous materials are strictly followed according to environmental regulations and OSHS.  1. 2 Disposal methods of hazardous wastes are followed according to environmental regulations and OSHS.  1. 3 *PPE* is used according to OSHS. |
| 2. Control environmental Pollution | 2.1 Environmental pollution *control measures* are implemented in accordance with international protocols.  2.2 Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999  2.3 Methods for minimizing noise pollution is complied with based on *Noise* and Excessive Vibration *Pollution and Control Regulations*, 2009 |
| 3. Demonstrate sustainable resource use | 3.1 Methods for minimizing wastage are complied with based on organizational waste management guide  3.2 Waste management procedures are employed |

| | | | | following principles of 3Rs (Reduce, Reuse, Recycle) |
| | | 3.3 | Methods for economizing and reducing resource consumption are practiced as per the Constitution of Kenya 2010 Article 69. |
| 4. | Evaluate current practices in relation to resource usage | 4.1 | Information on resource efficiency systems and procedures are collected and provided as per work groups/sector |
| | | 4.2 | Current resource usage is measured and recorded as per work group |
| | | 4.3 | Current purchasing strategies are analyzed and recorded according to industry procedures. |
| | | 4.4 | Current work processes to access information and data is analyzed following enterprise protocol. |
| 5. | Identify environmental legislations/conventions for environmental concerns | 5.1 | Environmental legislations/conventions and local ordinances are identified according to the different environmental aspects/impact |
| | | 5.2 | Industrial standard/environmental practices are described according to the different environmental concerns |
| 6. | Implement specific environmental programs | 6.1 | Programs/Activities are identified according to organizations policies and guidelines. |
| | | 6.2 | Individual roles/responsibilities are determined and performed based on the activities identified. |
| | | 6.3 | Problems/constraints encountered are resolved in accordance with organizations' policies and guidelines |
| | | 6.4 | Stakeholders are consulted based on company guidelines |
| 7. | Monitor activities on Environmental protection/Programs | 7.1 | Activities are periodically monitored and Evaluated according to the objectives of the environmental program |
| | | 7.2 | Feedback from stakeholders are gathered and considered in Proposing enhancements to the program based on consultations |
| | | 7.3 | Data gathered are analyzed based on Evaluation |

| | requirements |
|---|---|
| | 7.4  Recommendations are submitted based on the findings |
| | 7.5  Management support systems are set/established to sustain and enhance the program |
| | 7.6  Environmental incidents are monitored and reported to |
| | 7.7  concerned/proper authorities |
| 8.  Analyze resource use | 8.1  All resource consuming processes are Identified as per the organizational work plan |
| | 8.2  Quantity and nature of resource consumed is determined based on processes |
| | 8.3  Resource flow is analyzed as per different parts of the process. |
| | 8.4  Wastes are classified according to NEMA regulations on waste management. |
| 9.  Develop resource Conservation plans | 9.1.  Efficiency of use/conversion of resources is determined according to industry protocol. |
| | 9.2.  Causes of low efficiency of use of resources are Determined based on industry protocol. |
| | 9.3.  Plans for increasing the efficiency of resource use are developed based on findings. |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1.  PPE may include but not limited to | • Mask<br>• Gloves<br>• Goggles<br>• Safety hat<br>• Overall<br>• Hearing protector |

| | |
|---|---|
| 2. Control measures may include but not limited to | • Methods for minimizing or stopping spread and ingestion of airborne particles<br><br>• Methods for minimizing or stopping spread and ingestion of gases and fumes<br><br>• Methods for minimizing or stopping spread and ingestion of liquid wastes |

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

- Measuring
- Recording
- Analytical
- Monitoring
- Communication
- Writing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

- PPEs
- Environmental regulations
- OSHS
- Pollution
- Waste management
- Principle of 3Rs
- Types of resources
- Techniques in measuring current usage of resources
- Environmental hazards
- Regulatory requirements

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| | 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: |
|---|---|---|
| | | 1.1 Controlled environmental hazard |
| | | 1.2 Controlled environmental pollution |
| | | 1.3 Demonstrated sustainable resource use |
| | | 1.4 Evaluated current practices in relation to resource usage |
| | | 1.5 Demonstrated knowledge of environmental legislations and local ordinances according to the different environmental issues /concerns. |
| | | 1.6 Described industrial standard environmental practices according to the different environmental issues/concerns. |
| | | 1.7 Resolved problems/ constraints encountered based on management standard procedures |
| | | 1.8 Implemented and monitored environmental practices on a periodic basis as per company guidelines |
| | | 1.9 Recommended solutions for the improvement of the program |
| | | 1.10 Monitored and reported to proper authorities any environmental incidents |
| | 2. Resource Implications | The following resources should be provided: |
| | | 2.1 Workplace with storage facilities |
| | | 2.2 Tools, materials and equipment relevant to the tasks (e.g. Cleaning tools, cleaning materials, trash bags) |
| | | 2.3 PPE, manuals and references |
| | | 2.4 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection |
| | | 2.5 Case studies/scenarios relating to environmental Protection |
| 3 | Methods of Assessment | Competency in this unit may be assessed through: |
| | | 3.1 Observation |
| | | 3.2 Oral questioning |
| | | 3.3 Written test |

| | | 3.4 Portfolio of Evidence |
|---|---|---|
| | | 3.5 Interview |
| | | 3.6 Third party report |
| 4 | Context of Assessment | Competency may be assessed<br>4.1 On-the-job |
| | | 4.2 Off-the –job |
| | | 4.3 During Industrial attachment |
| 5 | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** FOP/OS/FT/BC/07/6/A

## UNIT DESCRIPTION

This unit specifies the competencies required to demonstrate occupational health and safety practices. It involves identifying workplace hazards and risks, identifying and implementing appropriate control measures to hazards and risks and implementing OSH programs, procedures and policies/guidelines.

## ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT<br>These describe the key outcomes which make up workplace function. | PERFORMANCE CRITERIA<br>These are assessable statements which specify the required level of performance for each of the elements.<br>***Bold and italicized terms are elaborated in the Range*** |
|---|---|
| 1. Identify workplace hazards and risk | 1.1 ***Hazards*** in the workplace are identified ***based their indicators***<br>1.2 Risks and hazards are evaluated based on legal requirements.<br>1.3 ***OSH concerns*** raised by workers are addressed as per legal requirements. |
| 2. Control OSH hazards | 2.1 Hazard prevention ***and control measures*** are implemented as per legal requirement.<br>2.2 Risk assessment is conducted and a risk matrix developed based on likely impact.<br>2.3 ***Contingency measures***, including ***emergency procedures*** during workplace ***incidents and emergencies*** are recognized and established in accordance with organization procedures. |
| 3. Implement OSH programs | 3.1 Company OSH program are identified, evaluated and reviewed based on legal requirements.<br>3.2 Company OSH programs are implemented as per legal requirements.<br>3.3 Workers are capacity built on OSH standards and procedures as per legal requirements<br>3.4 ***OSH-related records*** are maintained as per legal requirements. |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. Hazards may include but not limited to: | • Physical hazards – impact, illumination, pressure, noise, |
| | • vibration, extreme temperature, radiation |
| | • Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects |
| | • Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors |
| | • Ergonomics |
| | • Psychological factors – over exertion/ excessive force, |
| | • awkward/static positions, fatigue, direct pressure, |
| | • varying metabolic cycles |
| | • Physiological factors – monotony, personal relationship, work out cycle |
| | • Safety hazards (unsafe workplace condition) – confined space, excavations, falling objects, gas leaks, electrical, poor storage of materials and waste, spillage, waste and debris |
| | • Unsafe workers' act (Smoking in off-limited areas, Substance and alcohol abuse at work) |
| 2. Indicators may include but not limited to: | • Increased of incidents of accidents, injuries |
| | • Increased occurrence of sickness or health complaints/ symptoms |
| | • Common complaints of workers related to OSH |
| | • High absenteeism for work-related reasons |

| | |
|---|---|
| 3. OSH concerns may include but not limited to: | • Workers' experience/observance on presence of work hazards<br><br>• Unsafe/unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks)<br><br>• Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/guidelines |
| 4. Safety gears /PPE (Personal Protective Equipment) may include but not limited to: | • Arm/Hand guard, gloves<br><br>• Eye protection (goggles, shield)<br><br>• Hearing protection (ear muffs, ear plugs)<br><br>• Hair Net/cap/bonnet<br><br>• Hard hat<br><br>• Face protection (mask, shield)<br><br>• Apron/Gown/coverall/jump suit<br><br>• Anti-static suits<br><br>• High-visibility reflective vest |

| | |
|---|---|
| 5. Appropriate risk controls may include but not limited to: | • Appropriate risk controls in order of impact are as follows:<br><br>• Eliminate the hazard altogether (i.e., get rid of the dangerous machine)<br><br>• Isolate the hazard from anyone who could be harmed (i.e., keep the machine in a closed room and operate it remotely; barricade an unsafe area off)<br><br>• Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one)<br><br>• Use administrative controls to reduce the risk (i.e., train workers how to use equipment safely; train workers about the risks of harassment; issue signage)<br><br>• Use engineering controls to reduce the risk (i.e., attach guards to the machine to protect users)<br><br>• Use personal protective equipment (i.e., wear gloves and goggles when using the machine) |
| 6. Contingency measures may include but not limited to: | • Evacuation<br><br>• Isolation<br><br>• Decontamination<br><br>• (Calling designed) emergency personnel |
| 7. Incidents and emergencies may include but not limited to: | • Chemical spills<br><br>• Equipment/vehicle accidents<br><br>• Explosion<br><br>• Fire<br><br>• Gas leak<br><br>• Injury to personnel<br><br>• Structural collapse<br><br>• Toxic and/or flammable vapors emission. |

| 8. OSH-related Records may include but not limited to: | • Medical/Health records |
| | • Incident/accident reports |
| | • Sickness notifications/sick leave application |
| | • OSH-related trainings obtained |

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Communication
- Interpersonal
- Presentation
- Risk assessment
- Evaluation
- Critical thinking
- Problem solving
- Negotiation

### Required Knowledge

The individual needs to demonstrate knowledge of:

- General OSH Principles
- Occupational hazards/risks recognition
- OSH organizations providing services on OSH evaluation and/or work environment measurements (WEM)
- National OSH regulations; company OSH policies and protocols
- Systematic gathering of OSH issues and concerns
- General OSH principles
- National OSH regulations
- Company OSH and recording protocols, procedures and policies/guidelines
- Training and/or counseling methodologies and strategies

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: |
| | 1.1 Identified hazards in the workplace based their indicators |

| | |
|---|---|
| | 1.2 Evaluated workplace hazards based on legal requirements. |
| | 1.3 Addressed OSH concerns raised by workers as per legal requirements. |
| | 1.4 Implemented hazard prevention and control measures as per legal requirement. |
| | 1.5 Conducted risk assessment as per legal requirement. |
| | 1.6 Developed risk matrix based on likely impact. |
| | 1.7 Recognized and established contingency measures in accordance with organization procedures. |
| | 1.8 Identified, evaluated and reviewed company OSH program based on legal requirements. |
| | 1.9 Implemented company OSH programs as per legal requirements. |
| | 1.10 Capacity built workers on OSH standards and procedures as per legal requirements |
| | 1.11 Maintained OSH-related records as per legal requirements. |
| 2. Resource Implications | The following resources should be provided: <br> 2.3 Access to relevant workplace where assessment can take place <br><br> 2.4 Appropriately simulated environment where assessment can take place |
| 3. Methods of Assessment | Competency in this unit may be assessed through: <br> 3.1 Observation <br><br> 3.2 Oral questioning <br><br> 3.3 Written test <br><br> 3.4 Portfolio of Evidence <br><br> 3.5 Interview <br><br> 3.6 Third party report |
| 4. Context of Assessment | Competency may be assessed: <br> 4.1 On-the-job |

| | |
|---|---|
| | 4.2 Off-the –job |
| | 4.3 During Industrial attachment |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**CORE UNITS OF COMPETENCY**

# MANAGE QUALITY OF FOOD PRODUCTS

**UNIT CODE:** FOP/OS/FT/CR/01/6/A

## UNIT DESCRIPTION

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

It applies to the Food Technology sector.

## ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT<br>These describe the **key outcomes** which make up **workplace function**. | PERFORMANCE CRITERIA<br>These are **assessable** statements which specify the required level of performance for each of the elements.<br>***Bold and italicized terms are elaborated in the range.*** |
|---|---|
| 1. Establish food safety and quality systems | 1.1 Food safety and quality systems are designed and established as per legal and regulatory requirements and<br>1.2 Food safety and quality systems are implemented and maintained as per legal and regulatory requirements and workplace quality manual<br>1.3 Food safety and quality records are developed and maintained according to legal and regulatory requirements |
| 2. Manage quality operations | 2.1 Quality operations are planned and executed as per overall workplace plan<br>2.2 Quality operations resources are allocated and controlled as per workplace policy<br>2.3 Quality operations are organized as per workplace policy<br>2.4 Quality operations are coordinated as per workplace policy<br>2.5 Audit of quality operations is carried out based on workplace policy<br>2.6 Leadership is provided based on workplace policy |
| 3. Prepare for raw material and product analyses | 3.1 ***Laboratory standards*** are established as per Codex/ AOAC and workplace quality manual<br>3.2 Laboratory standards are implemented based on Codex/ AOAC (international laboratory standards) and workplace quality manual<br>3.3 Laboratory status is confirmed according to laboratory code of practice<br>3.4 Regulatory ***and statutory requirements*** for food |

| | laboratory practices are adhered to |
|---|---|
| 4. Carry out raw material, packaging materials and finished products analyses | 4.1 *Sampling procedures* are adhered to as per workplace quality manual<br>4.2 Samples are prepared and analyzed based on specific *test* procedure<br>4.3 Testing reagents are prepared and equipment calibrated according to specifications<br>4.4 Analyses results are interpreted, reported and appropriate decisions made based on test outcomes and workplace standards |

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. Laboratory standards may include but are not limited to: | • AOAC/CODEX<br>• National laboratory standards<br>• Workplace laboratory standards |
| 2. Regulatory and statutory requirements may include but are not limited to: | • Cap 242 (Public Health Act)<br>• Cap 254 (Food, Drugs and Chemical<br>• Substances Act)<br>• NEMA regulations<br>• OSH Act 2007 |
| 3. Sampling procedures may include but are not limited to: | • General-Random, Stratified<br>• Workplace<br>• KEBS standards |
| 4. Tests may include but are not limited to: | • Microbiological<br>• Physical<br>• Chemical<br>• Organic<br>• Organoleptic |
| 5. Food safety and quality systems may include but are not limited to: | • International standards e.g., FSSC, ISO, GFSI, PRC, HACCP<br>• National standards e.g., KEBS<br>• Workplace standards |

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:
- Communication
- Interpersonal
- Leadership
- Planning
- Problem solving
- Root-cause analysis
- Negotiation
- Interpretation
- Trouble shooting
- Apparatus handling
- Analytical
- Sampling
- Training/facilitation
- Computer

**Required Knowledge**

The individual needs to demonstrate knowledge of:
- Food chemistry Food analysis
- Food microbiology
- Quality/Safety management systems Quality management
- Pest and rodent control Emerging issues
- Principles of food engineering Environmental safety
- Laboratory techniques

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: Demonstrates; |
|---|---|
| | 1.1 Demonstrated knowledge of laboratory standards |
| | 1.2 Demonstrated knowledge of relevant legal, statutory and regulatory requirements |
| | 1.3 Adhered to lab code of practice |
| | 1.4 Demonstrated knowledge of various sampling techniques |
| | 1.5 Demonstrated ability to carry out food lab test/analyses |

| | | 1.6 Reported and interpreted test results correctly and objectively |
| | | 1.7 Demonstrated knowledge of various quality and food safety systems |
| 2. | Resource Implications | The following resources must be provided: <br> 2.1 Workplace or assessment location with a functional food laboratory |
| 3. | Methods of Assessment | Competency may be accessed through: <br> 3.1 Observation <br> 3.2 Oral questioning <br> 3.3 Projects <br> 3.4 Written tests <br> 3.5 Third party reports <br> 3.6 Portfolio |
| 4. | Context of Assessment | Competency may be assessed: <br> 4.1 On the job <br> 4.2 Off the job <br> 4.3 In work placement (attachment) <br> Off the job assessment must be undertaken in a closely simulated workplace environment |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry subsector, workplace and job roles is recommended. |

# CONTROL QUALITY OF BEE PRODUCTS

**UNIT CODE:** FOP/OS/FT/CR/02/6/A

**UNIT DESCRIPTION:**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT<br>These describe the key outcomes which make up workplace function. | PERFORMANCE CRITERIA<br>These are assessable statements which specify the required level of performance for each of the elements.<br>*Bold and italicized terms are elaborated in the Range* |
|---|---|
| 1 Establish food safety and quality systems | 1.1 *Food safety and quality systems* are designed and established as per legal, regulatory requirements and workplace quality manual<br>1.2 Food safety and quality systems are implemented and maintained as per legal, regulatory requirements and workplace quality manual<br>1.3 Food safety and quality records are developed and maintained according to legal and regulatory requirements |
| 2 Manage quality operations | 2.1 Quality operations are planned and executed as per overall workplace plan<br>2.2 Quality operations resources are allocated and controlled as per workplace procedures.<br>2.3 Quality operations are organized as per workplace procedures.<br>2.4 Quality operations are coordinated as per workplace procedures.<br>2.5 Audit of quality operations is carried out based on workplace procedures. |
| 3 Prepare for bee product analyses | 3.1 *Laboratory standards* are established as per Codex/ AOAC/KEBS and workplace quality manual.<br>3.2 Laboratory standards are implemented based on Codex/ AOAC (International laboratory standards) and workplace quality manual.<br>3.3 Laboratory status is confirmed according to laboratory code of practice.<br>3.4 *Regulatory and statutory requirements* for food laboratory practices are adhered to |

| ELEMENT<br>These describe the key outcomes which make up workplace function. | PERFORMANCE CRITERIA<br>These are assessable statements which specify the required level of performance for each of the elements.<br>*Bold and italicized terms are elaborated in the Range* |
|---|---|
| 4  Carry out bee products analyses | 4.1  *Sampling procedures* are adhered to as per workplace quality manual<br>4.2  Samples are prepared and analyzed based on specific *test* procedure<br>4.3  Testing reagents are prepared, and equipment calibrated according to specifications<br>4.4  Analyses results are interpreted, reported and appropriate decisions made based on test outcomes and workplace standards. |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1.  Laboratory standards may include but are not limited to: | • AOAC/CODEX<br>• National laboratory standards<br>• Workplace laboratory standards<br>• KEBS |
| 2.  Regulatory and statutory requirements may include but are not limited to: | • Cap 242 (public health act)<br>• Cap 254 (food, drugs and chemical substances act)<br>• NEMA regulations<br>• OSH Act 2007 |
| 3.  Sampling procedures may include but are not limited to: | • General-Random, Stratified<br>• Workplace<br>• KEBS standards |
| 4.  Tests may include but are not limited to: | • Miro-biological<br>• Physical<br>• Chemical<br>• Organic<br>• Organoleptic |
| 5.  Food safety and quality systems may include but are not limited to: | • International standards e.g., FSSC, ISO GFSI PRC, HACCP<br>• National standards e.g., KEBS<br>• Workplace standards |

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:
- Communication
- Interpersonal
- Leadership
- Planning
- Problem solving
- Route cause analysis
- Negotiation
- Interpretation
- Trouble shooting
- Apparatus handling
- Analytical
- Sampling
- Training/facilitation
- Computer

### Required Knowledge

The individual needs to demonstrate knowledge of:
- Food chemistry
- Food Analysis
- Food microbiology
- Quality/Safety management Systems
- Quality management
- Pest and rodent control
- Emerging Issues
- Principles of food engineering
- Environmental safety
- Laboratory techniques

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: |
|---|---|
| | 1.1 Demonstrated knowledge of laboratory standards |
| | 1.2 Demonstrated knowledge of relevant legal, statutory and |

| | | regulatory requirements. |
|---|---|---|
| | | 1.3 Adhered to lab code of practice. |
| | | 1.4 Demonstrated knowledge of various sampling techniques. |
| | | 1.5 Demonstrated ability to carry out food lab test/analyses. |
| | | 1.6 Reported and interpreted test results correctly and objectively. |
| | | 1.7 Demonstrated knowledge of various quality and food safety systems. |
| 2. | Resource Implications | The following resources **MUST** be provided:<br>2.1 Workplace or assessment location with a functional food laboratory. |
| 3. | Methods of Assessment | Competency may be assessed through:<br>3.1 Observation<br>3.2 Oral questioning<br>3.3 Projects<br>3.4 Written tests<br>3.5 Third party<br>3.6 Portfolio |
| 4. | Context of Assessment | Competency may be assessed:<br>4.1 On the job<br>4.2 Off the job<br>4.3 In work placement (attachment)<br>Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PROCESS FOOD PRODUCTS

**UNIT CODE:** FOP/OS/FT/CR/03/6/A

## UNIT DESCRIPTION

This unit specifies the competencies required to process food products. It involves preparing production schedules and production lines, overseeing line operations and sanitation, and documenting production records. It is for food technologists involved in managing food plants in areas such as food processing plants and food technology training/research institutions.

It applies in the Food Processing sector.

## ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT<br>These describe the **key outcomes** which make up **workplace function**. | PERFORMANCE CRITERIA<br>These are **assessable** statements which specify the required level of performance for each of the elements.<br>*Bold and italicized terms are elaborated in the range.* |
|---|---|
| 1. Prepare for food product processing | 1.1 *Production schedules* are prepared in accordance to the business plan<br><br>1.2 *Production materials* are acquired as per workplace policy<br><br>1.3 Production line is prepared in accordance with the production schedule workplace policy, *quality standards* and process standards |
| 2. Oversee food product processing | 2.1 Food products are processed as per SOPs<br>2.2 Processing personnel are supervised as per workplace policy<br>2.3 Product quality is assured as per product standards<br>2.4 Production process is monitored as per workplace processing parameters<br>2.5 Efficiency of production equipment is monitored in accordance with its specification<br>2.6 *GMPs* are adhered to as per workplace quality manual<br>2.7 Product is packaged and dispatched as per workplace policy<br>2.8 Occupational safety and health issues and concerns are addressed in accordance with workplace policy |

| | | |
|---|---|---|
| 3. Document food processing activities | 3.1 Production records are maintained as per workplace policy | |
| | 3.2 Food processing activities are recorded as per workplace policy and operations manual | |
| | 3.3 Sanitation, handover and dispatch records are prepared as per workplace policy | |
| | 3.4 *Processing personnel* records are prepared and disseminated as per workplace policy | |
| | 3.5 Food processing reports are prepared and disseminated as per workplace policy | |
| 4. Shutdown processing line | 4.1 *Shutdown procedures* are followed as per workplace operations manual | |
| | 4.2 Handover notes are prepared as per workplace policy and operation manual | |
| | 4.3 Production line is cleaned and sanitized as per workplace quality standards | |
| | 4.4 Maintenance is carried out as per maintenance schedule and food quality standards | |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. Production schedules may include but are not limited to: | • Daily/shifts<br>• Weekly<br>• Monthly |
| 2. Production resources may include but are not limited to: | • Packaging<br>• Raw materials<br>• Tools<br>• Equipment<br>• Supplies/Utilities<br>• Human resource<br>• Storage/warehousing<br>• Transport<br>• Production |

| | |
|---|---|
| 3. Quality standards may include but are not limited to: | • QMS<br>• FSMS<br>• FSSC<br>• HACCP<br>• EMS<br>• OSHA<br>• BRC<br>• GLPs |
| 4. Food products may include but are not limited to: | • Meat and meat products<br>• Milk and dairy products<br>• Cereals and cereal products<br>• Sea foods<br>• Fats and oils<br>• Spices and condiments<br>• Alcoholic and non-alcoholic beverages<br>• Fruits and vegetables<br>• Confectionaries and baked products<br>• Roots and tubers products |
| 5. Processing personnel may include but are not limited to: | • Manager<br>• Supervisor<br>• Machine operator<br>• Maintenance team<br>• Clerks<br>• General workers |
| 6. Product standards may include but are not limited to: | • Physical<br>• Chemical<br>• Microbiological<br>• Organoleptic |
| 7. GMPs may include but are not limited to: | • Personnel hygiene<br>• Sanitation<br>• Pest control<br>• Training<br>• Plant maintenance<br>• Storage and warehousing<br>• Utilities<br>• Waste management |
| 8. Shutdown procedures may include but are not limited to: | • Equipment shutdown procedure<br>• Cleaning procedures<br>• Emergency shutdown procedures<br>• Utilities shutdown procedures |
| 9. Processing parameter may include but are not limited to: | • Temperature<br>• Time<br>• Pressure<br>• Moisture<br>• PH<br>• Total dissolved solids |

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills
The individual needs to demonstrate the following skills:
- Communication
- Computer
- Interpersonal
  Leadership Planning
- Problem solving
- Root-cause analysis
- Negotiation
- Trouble shooting
- Analytical
- Sampling
- Tools and equipment handling
- Training
- Measurement and control
- Auditing
- Coordination

### Required Knowledge
The individual needs to demonstrate knowledge of:
- Food engineering
- Food chemistry
- Food microbiology
- Food biotechnology
- Quality management
- Technology of specific products
- Food Safety Management Systems
- Statutory legislations and regulations
- Food Packaging
- Emerging issues

## EVIDENCE GUIDE
This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: |
|---|---|
| | 1.1 Prepared production schedules<br>1.2 Demonstrated understanding of quality standards<br>1.3 Demonstrated understanding of product standards |

| | | 1.4 Demonstrated understanding of processing parameters |
|---|---|---|
| | | 1.5 Supervised workers in span of control |
| | | 1.6 Applied GMPs appropriately |
| | | 1.7 Demonstrated an understanding of the technology of various food products/unit operations |
| | | 1.8 Demonstrated an understanding of various relevant procedures |
| | | 1.9 Maintained appropriate food processing documentation |
| 2. | Resource Implications | The following resources must be provided: 2.1 Workplace or assessment location with a functional food processing plant or pilot plant |
| 3. | Methods of Assessment | Competency may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Projects 3.4 Written tests 3.5 Third party reports 3.6 Portfolio |
| 4. | Context of Assessment | Competency may be assessed: 4.1 On the job 4.2 Off the job 4.3 In work placement (attachment) Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**MANAGE FOOD PROCESSING PLANT**

**UNIT CODE:** FOP/OS/FT/CR/03/6/A

**UNIT DESCRIPTION**

This unit describes the competencies required to manage food processing plant. It involves planning and coordinating plant activities, allocating and controlling plant resources, provide direction and leadership to plant personnel. It also involves representing the organization/plant in external fora.

It applies to the Food Processing sector.

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| These describe the **key outcomes** which make up **workplace function**. | These are **assessable** statements which specify the required level of performance for each of the elements. *Bold and italicized terms are elaborated in the range.* |
| 1. Plant plant activities | 1.1 *Goals* and *objectives* of the plant are developed based on the strategy of the processing plant<br>1.2 Tasks are developed as per goals and objectives of the plant<br>1.3 Required *plant resources* are determined based on tasks to be performed<br>1.4 Implementation schedule is developed based on tasks, objectives and resources availability<br>1.5 Methods of *monitoring progress* are determined based on implementation schedule<br>1.6 Plant plan is shared with implementers as per workplace policy |
| 2. Coordinate plant activities | 2.1 Organization structure is developed based on the requirements of the organization<br>2.2 Resources are allocated based on plant operation plan<br>2.3 Plant performance reports are prepared and disseminated to relevant authority<br>2.4 Inter-departmental review meetings are coordinated as per workplace requirements |
| 3. Control plant activities | 3.1 Follow-up is done to track progress as per plant plan<br>3.2 Actual performance is measured and analyzed against expected performance<br>3.3 *Course corrections* activities are conducted as per progress report<br>3.4 Resource utilization is monitored based on workplace |

| | policy |
|---|---|
| 4. Managing plant personnel | 4.1 Human resource policy is developed based on overall objective of the organization and best practices <br> 4.2 Staff is recruited based on human resources policy <br> 4.3 Staff is inducted and deployed based on human resource policy <br> 4.4 Staff is supervised and appraised based on human resource policy <br> 4.5 Staff performance assessment is carried out based on human resource policy <br> 4.6 Staff performance feedback is given based on performance assessment results <br> 4.7 Staff is *capacity built* and *mentored* based on training needs assessment report <br> 4.8 Staff is compensated, *motivated* and welfare programmes developed and maintained based on human resource policy <br> 4.9 Staff disciplinary and *separation issues* are handled as per human resource policy |
| 5. Represent the plant in external fora | 5.1 Communication policy is developed based on plant vision and best practices <br> 5.2 Plant *external communications* are handled as per communication policy <br> 5.3 *Legal and statutory requirements* are adhered to <br> 5.4 *Stakeholder* networks and *partnerships* are established and maintained as per workplace policy |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. Goals may include but are not limited to: | • Long term <br> • Medium term <br> • Short term |
| 2. Objectives may include but are not limited to: | • Strategic <br> • Long term <br> • Medium term <br> • Short term |
| 3. Legal and statutory requirements may include but are not limited to: | • Employment act 2007 <br> • Food handlers' certificate <br> • WIBA |

| | |
|---|---|
| | • NSSF<br>• Taxation<br>• NHIF<br>• Public Health Cap 242<br>• OSHA<br>• EMCA 1999<br>• Factories Act<br>• OSH 2007 |
| 4. Capacity building may include but are not limited to: | • Training (On-the-job, off-the-job)<br>• Mentorship<br>• Coaching |
| 5. Food Plant resources may include but are not limited to: | • Human<br>• Financial<br>• Equipment (Plant)<br>• Facility/premises<br>• Materials, supplies and utilities<br>• Land |
| 6. Product standards may include but are not limited to: | • Physical<br>• Chemical<br>• Microbiological<br>• Organoleptic |
| 7. Monitoring methods may include but are not limited to: | • Observation<br>• Measurement<br>• Personnel satisfaction survey<br>• Process audits |
| 8. Motivation may include but are not limited to: | • Promotion<br>• Financial<br>• Deployment<br>• Recognition |
| 9. Separation issues may include but are not limited to: | • Termination<br>• Retirement<br>• Dismissal<br>• Death<br>• Resignation<br>• Desertion |
| 10. Staff disciplinary issues may include but are not limited to: | • Absenteeism<br>• Desertion<br>• Poor performance<br>• Corruption |
| 11. Stakeholder networks may include but are not limited to: | • Industry associations<br>• Unions<br>• Government agencies<br>• NGO |

| | • Community |
|---|---|
| 12. Relevant authority may include but are not limited to: | • Functional managers<br>• Managing director<br>• Board of directors<br>• Government authorities |

**Required Skills and Knowledge**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:
- Communication
- Inter-personal
- Leadership
- Planning
- Organizing
- Problem solving
- Root-cause analysis
- Negotiation
- Trouble shooting
- Analytical
- Training
- Coordination
- Report writing
- Computer

**Required Knowledge**

The individual needs to demonstrate knowledge of:
- Human resource management
- Leadership
- Negotiation
- Management theories
- Budgeting and planning
- Finance management
- Resource mobilization
- Basic procurement
- Statutory legislation and regulations
- Emerging issues

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: <br><br>1.1 Developed goals and objectives of the processing plant <br>1.2 Developed a budget for the processing plant <br>1.3 Developed plan implementation and monitoring schedule <br>1.4 Prepared and disseminated plant performance reports <br>1.5 Measured and analyzed employee performance <br>1.6 Developed course corrections procedures <br>1.7 Monitored resources utilization <br>1.8 Demonstrated understanding of human resource policy and communication strategy <br>1.9 Demonstrated understanding of legal and statutory requirements |
|---|---|
| 2. Resource Implications | The following resources must be provided: <br>2.1 Workplace or assessment location |
| 3. Methods of Assessment | Competency may be assessed through: <br>3.1 Observation <br>3.2 Oral questioning <br>3.3 Projects <br>3.4 Written tests <br>3.5 Third party reports <br>3.6 Portfolio |
| 4. Context of Assessment | Competency may be assessed: <br>4.1 On the job <br>4.2 Off the job <br>4.3 In work placement (attachment) <br><br>Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEVELOP NEW FOOD PRODUCTS

**UNIT CODE:** FOP/OS/FT/CR/04/6/A

**UNIT DESCRIPTION**

This unit describes the competencies required to develop new food products. It involves conducting brainstorming sessions; conducting new product feasibility studies; developing and analysing new product prototype; conducting new product tests and market testing the new product as well as patenting, commercialization of the new product and conducting analysis of competing products in the market.

It applies in the Food Processing sector.

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT<br>These describe the **key outcomes** which make up **workplace function**. | PERFORMANCE CRITERIA<br>These are **assessable** statements which specify the required level of performance for each of the elements.<br>*Bold and italicized terms are elaborated in the range.* |
|---|---|
| 1. Conduct brainstorming sessions | 1.1 Multidisciplinary team is identified and formed based on target products to develop<br>1.2 Brainstorming is carried out in accordance with potential products to produce<br>1.3 Brainstorming outcomes are recorded and shared based on product development procedures<br>1.4 Plant plan is shared with implementers as per workplace policy |
| 2. Conduct new product feasibility studies | 2.1 Feasibility study strategy is developed based on overall plant plan<br>2.2 Required resources are identified and budgets developed as per feasibility study strategy<br>2.3 Feasibility study is conducted based on feasibility study strategy and best practice<br>2.4 Collected data and information is synthesized based on accepted statistical methods |
| 3. Market test new product | 3.1 New product *marketing protocol* is developed based on plant marketing plan<br>3.2 Market testing is conducted based on the marketing protocol<br>3.3 Marketing data and information is analyzed based on accepted statistical methods<br>3.4 Findings are documented, reports prepared and |

| | recommendations provided and disseminated to relevant authority |
|---|---|
| 4. Conduct new product tests | 4.1 New product is reformulated and improved based on market findings and recommendations<br>4.2 New product *laboratory tests* are conducted as per product standards and legal requirement<br>4.3 New product is registered with *relevant agencies* as per legal requirements<br>4.4 Packaging is developed based on the nature of the product, legal requirements and plant standards<br>4.5 New product information, properties and process specifications are documented as per workplace policy and best practice |
| 5. Introduce new product | 5.1 New product patents/Industrial Property Rights are obtained as per legal requirements<br>5.2 New product resourcing plan for commercialization is developed based on product formula and process steps<br>5.3 New product *quality monitoring framework* is developed as per plant quality standards |
| 6. Conduct competitor analysis | 6.1 Competing products are identified according to the market demands<br>6.2 Consumer feedbacks are recorded and analyzed according to the product performance in the market<br>6.3 Recommendations are made and undertaken based on competing products analysis outcome<br>6.4 Follow up on product performance is conducted based on workplace policy<br>6.5 Documentation of product performance and follow up is carried out based on workplace policy |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
|---|---|
| 1. Product standards may include but are not limited to: | • Physical<br>• Chemical<br>• Microbiological<br>• Organoleptic |

| | |
|---|---|
| 2. Resources and requirements may include but are not limited to: | • Human<br>• Financial<br>• Infrastructural |
| 3. Marketing protocol may include but are not limited to: | • Product<br>• Price<br>• Place<br>• Promotion |
| 4. Laboratory tests may include but are not limited to: | • Raw material tests<br>• In-process tests<br>• End product tests<br>• Shelf life<br>• Trade sample tests<br>• Non–conformance tests |
| 5. Relevant agencies may include but are not limited to: | • Functional managers and their team<br>• Managing director<br>• Board of directors<br>• Government authorities<br>• Suppliers |
| 6. Quality monitoring framework may include but are not limited to: | • Parameters to be tested<br>• Tests to be done<br>• Testing frequency<br>• Sampling method |

**Required Skills and Knowledge**
This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate skills of:
- Communication
- Inter-personal
- Leadership
- Planning
- Problem solving
- Root-cause analysis
- Interpretation
- Trouble shooting
- Apparatus handling
- Analytical
- Sampling

- Report writing
- Research
- Computer

**Required Knowledge**

The individual needs to demonstrate knowledge of:
- Food engineering Food chemistry Food analysis
- Food microbiology
- Basic research
- Quality/Safety management systems
- Food Biotechnology
- Technology of specific products Standardization
- Principles of procurement
- Statutory requirements and regulations
- Hygiene and sanitation
- GMPs
- Packaging Storage
- Emerging issues
- Competing product analysis

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate: |
|---|---|
| | 1.1 Carried out brainstorming sessions <br> 1.2 Conducted new food product feasibility study <br> 1.3 Developed new food product prototype <br> 1.4 Analyzed new food product prototype <br> 1.5 Market tested new food product <br> 1.6 Conducted new food product reformulation and testing <br> 1.7 Obtained new food product patents/Industrial Property Rights <br> 1.8 Developed new food product quality monitoring framework <br> 1.9 Analyzed and documented competing products in the market |
| 2. Resource Implications | The following resources must be provided: <br> 2.1 Workplace or assessment facility with a functional laboratory and pilot plant |
| 3. Methods of Assessment | Competency may be assessed through: |

| | |
|---|---|
| | 3.1 Observation<br>3.2 Oral questioning<br>3.3 Projects<br>3.4 Written tests<br>3.5 Performance analysis |
| 4. Context of Assessment | Competency may be assessed:<br>4.4 On the job<br>4.5 Off the job<br>4.6 In work placement (attachment)<br><br>Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |