REPUBLIC OF KENYA

COMPETENCY BASED CURRICULUM

FOR

FOOD TECHNOLOGY

easytvet.com

LEVEL 6

TVET CDACC
P.O. BOX 15745-00100
NAIROBI

First published 2018
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FOREWORD

The provision of quality education and training is fundamental to the Government's overall strategy for social-economic development. Quality education and training will contribute to achievement of Kenya's development blueprint and Sustainable Development Goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution and this resulted 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 TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

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

It is my conviction that this curriculum will play a great role towards development of competent human resource for Food Processing sector's growth and sustainable development.

PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING
MINISTRY OF EDUCATION

PREFACE

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

The Technical and Vocational Education and Training Act No. 29 of 2013 and Sessional Paper No. 4 of 2016 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with Food Technology Sector Skills Advisory Committee (SSAC) have developed this curriculum.

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

I am grateful to the Council Members, Council Secretariat, Food Technology SSAC, expert workers and all those who participated in the development of this curriculum.

CHAIRPERSON, TVET CDACC

ACKNOWLEDGEMENT

This curriculum has been designed for competency-based training and has independent units of learning that allow the trainee flexibility in entry and exit. In developing the curriculum, significant involvement and support was received from various organizations.

I recognize with appreciation the role of the Food Technology Sector Skills Advisory Committee (SSAC) in ensuring that competencies required by the industry are addressed in the curriculum.

I also thank all stakeholders in the Food Processing sector for their valuable input and all those who participated in the process of developing this curriculum

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

COUNCIL SECRETARY/CEO
TVET CDACC

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 Systems
FSMS	Food Safety Management Systems
GLC	Gas Liquid Chromatograph
GLPs	Good Laboratory Practices
GMO	Genetically Modified Organisms
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 Systems
SOPs	Standard Operating Procedures
TVET	Technical and Vocational Education and Training
UV	Ultraviolet

KEY TO UNIT CODE

FOP/CU/FT/BC/01/6/A

Industry or sector

Curriculum

Curriculum

Type of competency

Competency number

Competency level

Control version

Food Technology Certificate Level 6 qualification consists of units of learning that an individual must achieve to enable him/her to manage quality of food products; the food processing plant, process food products and to develop new food products.

The units of learning leading to Food Technologist Level 6 qualifications include the following seven basic and four core units:

Basic Units of Learning

Unit Code	Unit Title	Duration in Hours	Credit Factor
FOP/CU/FT/BC/01/6/A	Communication Skills	40	4
FOP/CU/FT/BC/02/6/A	Numeracy Skills	60	6
FOP/CU/FT/BC/03/6/A	Digital Literacy	60	6
FOP/CU/FT/BC/04/6/A	Entrepreneurship skills	100	10
FOP/CU/FT/BC/05/6/A	Employability Skills	80	8
FOP/CU/FT/BC/06/6/A	Environmental Literacy	40	4
FOP/CU/FT/BC/07/6/A	Occupational Safety and Health Practices	40	4
Total		**420**	**42**

Core Units of Learning

Unit Code	Unit Title	Duration in Hours	Credit Factor
FOP/CU/FT/CR/01/6/A	Food Product Quality Management	480	48
FOP/CU/FT/CR/02/6/A	Food Product Processing	480	48
FOP/CU/FT/CR/03/6/A	Food Processing Plant Management	360	36
FOP/CU/FT/CR/04/6/A	New Food Product Development	360	36
	Industrial Attachment	480	48
Total		**2160**	**216**
Grand Total		**2580**	**258**

Total number of hours is **2580** inclusive of 480 hours of industrial attachment.

Entry Requirements

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

   a) Kenya Certificate of Secondary Education KCSE C- (minus) Mathematics C- (minus)

   Any two Sciences C- (minus) English C- (minus)

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Or

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   b) Food Technology certificate level 5 with at least one-year continuous work experience

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Or

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

Provision for Industrial Attachment

It is envisaged that the trainee will undergo 480 hours industrial training and assessment within a recognized food industry as a prerequisite for completion of this course.

Provision for Research Project

It is a requirement that the trainee will have had 48 contact hours on research methods in preparation for carrying out a research project.

Assessment

The course will be assessed at two levels:

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

   b) **External assessment:** conducted by an accredited external assessor who is monitored by an accredited external verifier.

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

Certification

On successful completion of a unit of learning, a trainee will be issued with a Certificate of Competence and on successful completion of all units of learning a trainee will be awarded a Food Technology Certificate Level 6 qualification. These certificates will be issued by TVET CDACC in conjunction with training provider.

BASIC UNITS OF LEARNING

COMMUNICATION SKILLS

UNIT CODE: FOP/CU/FT/BC/01/6/A

Relationship to Occupational Standards
This unit addresses the Unit of Competency: Demonstrate Communication Skills

Duration of Unit: 40 hours

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.

Summary of Learning Outcomes
1. Meet communication needs of clients and colleagues
2. Develop communication strategies
3. Establish and maintain communication pathways
4. Promote use of communication strategies
5. Conduct interview
6. Facilitate group discussion
7. Represent the organization

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Meet communication needs of clients and colleagues	• Communication process • Modes of communication • Medium of communication • Effective communication • Barriers to communication • Flow of communication • Sources of information • Organizational policies • Organization requirements for written and electronic communication methods	• Interview • Written texts

	• Report writing • Effective questioning techniques (clarifying and probing) • Workplace etiquette • Ethical work practices in handling communication • Active listening • Feedback • Interpretation • Flexibility in communication • Types of communication strategies • Elements of communication strategy	
2. Develop communication strategies	• Dynamics of groups • Styles of group leadership • Openness and flexibility in communication • Communication skills relevant to client groups	• Interview • Written texts
3. Establish and maintain communication pathways	• Types of communication pathways	• Interview • Written texts
4. Promote use of communication strategies	• Application of elements of communication strategies • Effective communication techniques	• Interview • Written texts
5. Conduct interview	• Types of interviews • Establishing rapport • Facilitating resolution of issues • Developing action plans	• Interview • Written texts
6. Facilitate group discussion	• Identification of communication needs	• Interview

	• Dynamics of groups • Styles of group leadership • Presentation of information • Encouraging group members participation • Evaluating group communication strategies	• Written texts
7. Represent the organization	• Presentation techniques • Development of a presentation • Multi-media utilization in presentation • Communication skills relevant to client groups	• Interview • Written texts

Suggested Methods of Instructions
- Discussion
- Role playing
- Simulation
- Direct instruction

Recommended Resources
- Desktop computers/laptops
- Internet connection
- Projectors
- Telephone

NUMERACY SKILLS

UNIT CODE: FOP/CU/FT/BC/02/6/A

Relationship to Occupational Standards
This unit addresses the Unit of Competency: Demonstrate Numeracy Skills.

Duration of Unit: 60 hours

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.

Summary of Learning Outcomes
1. Apply a wide range of mathematical calculations for work
2. Apply ratios, rates and proportions to solve problems
3. Estimate, measure and calculate measurement for work
4. Use detailed maps to plan travel routes for work
5. Use geometry to draw and construct 2D and 3D shapes for work
6. Collect, organize and interpret statistical data
7. Use routine formula and algebraic expressions for work
8. Use common functions of a scientific calculator

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods

1. Apply a wide range of mathematical calculations for work	• Fundamentals of mathematics
	
	  • Addition, subtraction, multiplication and division of positive and negative numbers
	
	  • Algebraic expressions manipulation
	
	• Forms of fractions, decimals and percentages
		• Written tests
		
		• Assignments
		
		• Supervised exercises

		• Expression of numbers as powers and roots	

2.	Apply ratios, rates and proportions to solve problems	• Rates, ratios and proportions
		
		  • Meaning
		
		  • Conversions into percentages
		
		  • Direct and inverse proportions determination
		
		  • Performing calculations
		
		  • Construction of graphs, charts and tables
		
		  • Recording of information
			• Written tests
			• Assignments
			• Supervised exercises

3.	Estimate, measure and calculate measurement for work	• Units of measurements and their symbols • Identification and selection of measuring equipment • Conversion of units of measurement • Perimeters of regular figures • Areas of regular figures • Volumes of regular figures • Carrying out measurements • Recording of information	• Assignments • Supervised exercises • Written tests
4.	Use detailed maps to plan travel routes for work	• Identification of features in routine maps and plans • Symbols and keys used in routine maps and plans • Identification and interpretation of orientation of map to North • Demonstrate understanding of direction and location • Apply simple scale to estimate length of objects, or distance to	• Written • Practical test

		location or object	
		• Give and receive directions using both formal and informal language	
		• Planning of routes	
		• Calculation of distance, speed and time	
5.	Use geometry to draw and construct 2D and 3D shapes for work	• Identify two dimensional shapes and routine three dimensional shapes in everyday objects and in different orientations	
		• Explain the use and application of shapes	
		• Use formal and informal mathematical language and symbols to describe and compare the features of two dimensional shapes and routine three dimensional shapes	
		• Identify common angles	
		• Estimate common angles in everyday objects	
		• Evaluation of unknown angles	
		• Use formal and informal mathematical language to describe and compare common angles	
		• Symmetry and similarity	
		• Use common geometric instruments to draw two dimensional shapes	
		• Construct routine three dimensional objects from given nets	

6. Collect, organize and interpret statistical data	• Classification of data
	  • Grouped data
	  • Ungrouped data
	• Data collection
	  • Observation
	  • Recording
	• Distinguishing between sampling and census
	• Importance of sampling
	• Errors in sampling
	• Types of sampling and their limitations e.g.
	  • Stratified random
	  • Cluster
	  • Judgmental
	• Tabulation of data
	  • Class intervals
	  • Class boundaries
	  • Frequency tables
	  • Cumulative frequency
	• Diagrammatic and graphical presentation of data e.g.
	  • Histograms
	  • Frequency polygons
	  • Bar charts
	  • Pie charts
	  • Cumulative frequency curves
	❑ Interpretation of data
		• Assignments
		• Supervised exercises
		• Written tests

7. Use routine formula and algebraic expressions for work	• Solving linear equations
	• Linear graphs
	   • Plotting
	   • Interpretation
	• Applications of linear graphs
	• Curves of first and second degree
	   • Plotting
	   • Interpretation
		• Assignments
		• Supervised exercises
		• Written tests

8. Use common functions of a scientific calculator	• Identify and use keys for common functions on a calculator • Calculate using whole numbers, money and routine decimals and percentages • Calculate with routine fractions and percentages • Apply order of operations to solve multi-step calculations • Interpret display and record result	• • Written • Practical test

Suggested Methods of Instructions
- Group discussions
- Demonstration by trainer
- Practical work by trainee
- Exercises

Recommended Resources
- Calculators
- Rulers, pencils, erasers
- Charts with presentations of data
- Graph books
- Dice

DIGITAL LITERACY

UNIT CODE: FOP/CU/FT/BC/03/6/A

Relationship to Occupational Standards
This unit addresses the Unit of Competency: Demonstrate Digital Literacy

Duration of Unit: 60 hours

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

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

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify computer hardware and software	- Concepts of ICT - Functions of ICT - History of computers - Components of a computer - Classification of computers	- Written tests - Oral presentation
2. Apply security measures to data, hardware, software in automated environment	- Data security and control - Security threats and control measures - Types of computer crimes - Detection and protection against computer crimes	- Written tests - Oral presentation - Project

	• Laws governing protection of ICT		
3. Apply computer software in solving tasks	• Operating system • Word processing • Spread sheets • Data base design and manipulation • Data manipulation, storage and retrieval	• Oral questioning • Project	
4. Apply internet and email in communication at workplace	• Computer networks • Network configurations • Uses of internet • Electronic mail (e-mail) concept	• Oral questioning • Written report	
5. Apply desktop publishing in official assignments	• Concept of desktop publishing • Opening publication window • Identifying different tools and tool bars • Determining page layout • Opening, saving and closing files • Drawing various shapes using DTP • Using colour pellets to enhance a document • Inserting text frames • Importing and exporting text • Object linking and embedding • Designing of various publications • Printing of various publications	• Oral questioning • Written report • Project	

6. Prepare presentation packages	• Types of presentation packages • Procedure of creating slides • Formatting slides • Presentation of slides • Procedure for editing objects	• Oral questioning • Written report • Project

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

Recommended Resources
- Computers
- Printers
- Storage devices
- Internet access

ENTREPRENEURSHIP SKILLS

UNIT CODE: FOP/CU/FT/BC/04/6/A

Relationship to occupational standards

This unit addresses the Unit of Competency: Demonstrate Understanding of Entrepreneurship

Duration of unit: 100 hours

Unit Description

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

Summary of Learning Outcomes

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

Learning Outcome	Content	Suggested Assessment Methods
1. Demonstrate knowledge of entrepreneurship and self-employment	- Importance of self-employment - Requirements for entry into self-employment - Role of an Entrepreneur in business - Contributions of Entrepreneurs	- Individual/group assignments - Projects - Written tests - Oral questions - Third party report

	to National development • Entrepreneurship culture in Kenya • Born or made entrepreneurs	• Interviews	
2. Identify entrepreneurship opportunities	• Business ideas and opportunities • Sources of business ideas • Business life cycle • Legal aspects of business • Assessment of product demand • Business environment • Factors to consider when evaluating business	• Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews	
3. Create entrepreneurial awareness	• Forms of businesses • Sources of business finance • Factors in selecting source of business finance • Governing policies on Small Scale Enterprises (SSEs) • Problems of starting and operating SSEs	• Individual/group assignments • Projects • Written tests • Oral questions • Third party report • Interviews	
4. Apply entrepreneurial motivation	• Internal and external motivation • Motivational theories • Self-assessment • Entrepreneurial orientation • Effective communications in entrepreneurship • Principles of communication	• Case studies • Individual/group assignments • Projects • Written tests • Oral questions • Third party report	

5. Develop business innovative strategies	• Innovation in business • Small business Strategic Plan • Creativity in business development • Linkages with other entrepreneurs • ICT in business growth and development	• Case studies • Individual/group assignments • Projects • Written tests • Oral questions • Third party report
6. Develop Business Plan	• Business description • Marketing plan • Organizational/Management • plan • Production/operation plan • Financial plan • Executive summary	• Case studies • Individual/group assignments • Projects • Written tests • Oral questions • Third party report

Suggested Methods of Instructions:

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

Recommended Resources

- Case studies

- Business plan templates

- Computers

- Overhead projectors

- Internet

- Mobile phone

- Video clips

- Films

- Newspapers and Handouts

- Business Journals

- Writing materials

EMPLOYABILITY SKILLS

UNIT CODE: FOP/CU/FT/BC/05/6/A

Relationship to Occupational Standards
This unit addresses the Unit of Competency: Demonstrate Employability Skills

Duration of Unit: 80 hours

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

Summary of Learning Outcomes
1. Conduct self-management

2. Demonstrate interpersonal communication

3. Demonstrate critical safe work habits

4. Lead a workplace team

5. Plan and organize work

6. Maintain professional growth and development

7. Demonstrate workplace learning

8. Demonstrate problem solving skills

9. Manage ethical performance

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Conduct self-management	• Self-awareness • Formulating personal vision, mission and goals • Strategies for overcoming life challenges • Managing emotions	• Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	• Emotional intelligence	
	• Assertiveness versus aggressiveness	
	• Expressing personal thoughts, feelings and beliefs	
	• Developing and maintaining high self-esteem	
	• Developing and maintaining positive self-image	
	• Setting performance targets	
	• Monitoring and evaluating performance	
	• Articulating ideas and aspirations	
	• Accountability and responsibility	
	• Good work habits	
	• Self-awareness	
	• Values and beliefs	
	• Self-development	
	• Financial literacy	
	• Healthy lifestyle practices	
	• Adopting safety practices	
2. Demonstrate interpersonal communication	• Meaning of interpersonal communication • Listening skills • Types of audience • Public speaking • Writing skills • Negotiation skills • Reading skills	• Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	• Meaning of empathy	
	• Understanding customers' needs	
	• Establishing communication networks	
	• Assertiveness	
	• Sharing information	
3. Demonstrate critical safe work habits	• Stress and stress management	• Written tests
	• Time concept	• Oral questioning
	• Punctuality and time consciousness	• Interviewing
	• Leisure	• Portfolio of evidence
	• Integrating personal objectives into organizational objectives	• Third party report
	• Resources mobilization	
	• Resources utilization	
	• Setting work priorities	
	• Developing healthy relationships	
	• HIV and AIDS	
	• Drug and substance abuse	
	• Managing emerging issues	
4. Lead a workplace team	• Leadership qualities	• Written tests
	• Power and authority	• Oral questioning
	• Team building	• Interviewing
	• Determination of team roles and objectives	• Portfolio of evidence
	• Team parameters and relationships	• Third party report
	• Individual responsibilities in a team	

	• Forms of communication	
	• Complementing team activities	
	• Gender and gender mainstreaming	
	• Human rights	
	• Developing healthy relationships	
	• Maintaining relationships	
	• Conflicts and conflict resolution	
	• Coaching and mentoring skills	
5. Plan and organize work	• Functions of management • Planning • Organizing • Time management • Decision making concept • Task allocation • Developing work plans • Developing work goals/objectives and deliverables • Monitoring work activities • Evaluating work activities • Resource mobilization • Resource allocation • Resource utilization • Proactive planning • Risk evaluation • Problem solving • Collecting, analysing and	• Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	organising information	
	• Negotiation	
6. Maintain professional growth and development	• Avenues for professional growth • Training and career opportunities • Assessing training needs • Mobilizing training resources • Licenses and certifications for professional growth and development • Pursuing personal and organizational goals • Managing work priorities and commitments • Recognizing career advancement	• Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report
7. Demonstrate workplace learning	• Managing own learning • Mentoring • Coaching • Contributing to the learning community at the workplace • Cultural aspects of work • Networking • Variety of learning context • Application of learning • Safe use of technology • Taking initiative/proactivity • Flexibility • Identifying opportunities • Generating new ideas	• Written tests • Oral questioning • Interviewing • Portfolio of evidence • Third party report

	• Workplace innovation	
	• Performance improvement	
	• Managing emerging issues	
	• Future trends and concerns in learning	
8. Demonstrate problem solving skills	• Critical thinking process	• Written tests
	• Data analysis tools	• Oral questioning
	• Decision making	• Interviewing
	• Creative thinking	• Portfolio of evidence
	• Development of creative, innovative and practical solutions	• Third party report
	• Independence in identifying and solving problems	
	• Solving problems in teams	
	• Application of problem-solving strategies	
	• Testing assumptions	
	• Resolving customer concerns	
9. Manage ethical performance	• Meaning of ethics	• Written tests
	• Ethical perspectives	• Oral questioning
	• Principles of ethics	• Interviewing
	• Ethical standards	• Portfolio of evidence
	• Organization code of ethics	• Third party report
	• Common ethical dilemmas	
	• Organization culture	
	• Corruption, bribery and conflict of interest	
	• Privacy and data protection	
	• Diversity, harassment and	

	mutual respect
	• Financial responsibility/accountability
	• Etiquette
	• Personal and professional integrity
	• Commitment to jurisdictional laws
	• Emerging issues in ethics

Suggested Methods of Instructions
- Demonstrations
- Simulation/Role play
- Group Discussion
- Presentations
- Assignments
- Q&A

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

ENVIRONMENTAL LITERACY

UNIT CODE: FOP/CU/FT/BC/06/6/A

Relationship to Occupational Standards:
This unit addresses the Unit of Competency: Demonstrate Environmental Literacy

Duration of Unit: 40 hours

Unit Description
This unit describes the competencies required demonstrate environmental literacy.it involves controlling environmental hazard, controlling environmental pollution, complying with workplace sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs, monitoring activities on environmental protection/programs, analysing resource use and developing resource conservation plans.

Summary of Learning Outcomes
1. Control environmental hazard
2. Control environmental Pollution
3. Demonstrate sustainable resource use
4. Evaluate current practices in relation to resource usage
5. Identify Environmental legislations/conventions for environmental concerns
6. Implement specific environmental programs
7. Monitor activities on Environmental protection/Programs
8. Analyze resource use
9. Develop resource conservation plans

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Control environmental hazard	- Purposes and content of Environmental Management and Coordination Act 1999 - Storage methods for environmentally hazardous materials - Disposal methods of hazardous wastes - Types and uses of PPE in line with environmental regulations	- Written questions - Oral questions

	• Occupational Safety and Health Standards (OSHS)		
2. Control environmental Pollution control	• Types of pollution • Environmental pollution control measures • Types of solid wastes • Procedures for solid waste management • Different types of noise pollution • Methods for minimizing noise pollution	• Written questions • Oral questions • Role play	
3. Demonstrate sustainable resource use	• Types of resources • Techniques in measuring current usage of resources • Calculating current usage of resources • Methods for minimizing wastage • Waste management procedures • Principles of 3Rs (Reduce, Reuse, Recycle) • Methods for economizing or reducing resource consumption	• Written questions • Oral questions • Role play	
4. Evaluate current practices in relation to resource usage	• Collection of information on environmental and resource efficiency systems and procedures, • Measurement and recording of current resource usage • Analysis and recording of current purchasing strategies. • Analysis of current work processes to access information and data • Identification of areas for	• Written questions • Oral questions • Role play	

	improvement	
5. Identify Environmental legislations/conventions for environmental concerns	• Environmental issues/concerns • Environmental legislations /conventions and local ordinances • Industrial standard /environmental practices • International Environmental Protocols (Montreal, Kyoto) • Features of an environmental strategy	• Written questions • Oral questions
6. Implement specific environmental programs	• Community needs and expectations • Resource availability • 5s of good housekeeping • Identification of programs/Activities • Setting of individual roles /responsibilities • Resolving problems /constraints encountered • Consultation with stakeholders	• Written questions • Oral questions • Role play
7. Monitor activities on Environmental protection/Programs	• Periodic monitoring and Evaluation of activities • Gathering feedback from stakeholders • Analyzing data gathered • Documentation of recommendations and submission • Setting of management support systems to sustain and enhance the program • Monitoring and reporting of	• Oral questions • Written tests • Practical test

		environmental incidents to concerned /proper authorities	
8. Analyze resource use	• Identification of resource consuming processes • Determination of quantity and nature of resource consumed • Analysis of resource flow through different parts of the process. • Classification of wastes for possible source of resources.	• Written tests • Oral questions • Practical test
9. Develop resource Conservation plans	• Determination of efficiency of use/conversion of resources • Causes of low efficiency of use of resources • Plans for increasing the efficiency of resource use	• Written tests • Oral questions • Practical test

Suggested Methods of Instructions
- Instructor led facilitation of theory
- Practical demonstration of tasks by trainer
- Practice by trainees
- Observations and comments and corrections by trainers

Recommended Resources
- Standard operating and/or other workplace procedures manuals

- Specific job procedures manuals

- Environmental Management and Coordination Act 1999

- Machine/equipment manufacturer's specifications and instructions

- Personal Protective Equipment (PPE)

- ISO standards

- Company environmental management systems (EMS)

- Montreal Protocol

- Kyoto Protocol

OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: FOP/CU/FT/BC/07/6/A

Relationship to Occupational Standards
This unit addresses the unit of competency: Demonstrate occupational safety and health practices

Duration of Unit: 40 hours

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

Summary of Learning Outcomes
1. Identify workplace hazards and risk
2. Control OSH hazards
3. Implement OSH programs

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify workplace hazards and risks	• Identification of hazards in the workplace and/or the indicators of their presence • Evaluation and/or work environment measurements of OSH hazards/risk existing in the workplace • Gathering of OSH issues and/or concerns	• Oral questions • Written tests • Portfolio of evidence • Third party report
2. Control OSH hazards	• Prevention and control measures e.g. use of PPE • Risk assessment • Contingency measures	• Oral questions • Written tests • Portfolio of evidence • Third party report

3. Implement OSH programs	• Company OSH program, evaluation and review • Implementation of OSH programs • Training of team members and advice on OSH standards and procedures • Implementation of procedures for maintaining OSH-related records	• Oral questions • Written tests • Portfolio of evidence • Third party report

Suggested Methods of instructions
- Assigments
- Discussion
- Q&A
- Role play
- Viewing of related videos

Recommended Resources
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE) e.g.
  - Mask
  - Face mask/shield
  - Safety boots
  - Safety harness
  - Arm/Hand guard, gloves
  - Eye protection (goggles, shield)
  - Hearing protection (ear muffs, ear plugs)
  - Hair Net/cap/bonnet
  - Hard hat
  - Face protection (mask, shield)
  - Apron/Gown/coverall/jump suit
  - Anti-static suits
  - High-visibility reflective vest

CORE UNITS OF LEARNING

FOOD PRODUCT QUALITY MANAGEMENT

UNIT CODE: FOP/CU/FT/CR/01/6/A

Relationship to Occupational Standards
This unit addresses the unit of competency: Manage quality of food products

Duration of Unit: 480 hours

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 raw material and product analyses and carrying out raw material and product analyses.

Summary of Learning Outcomes
1. Establishing food safety and quality systems
2. Managing quality operations
3. Preparing for raw material product analyses
4. Carrying out raw materials and product analyses

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Establishing food safety and quality systems	- Food engineering theory - Food safety and quality systems - Designing and establishing food safety and quality systems - Setting up workplace - Standard Operating Procedures (SOPs) - Documentation of food quality and safety procedures	- Written - Observation - Oral - Third party report
2. Managing quality operations	- Identification and mobilization of operational resources - Development of work schedules - Resource levelling and control - Organization and coordination of quality operations - Monitoring and evaluation of quality operations - Development of quality/safety management system	- Written - Observation - Oral - Third party report

	• Plant PRPs-Integrated pest and rodent management, staff welfare, laboratory waste management and disposal • Emerging trends in food quality • Internal audits and inspection	
3. Preparing for raw material and product analyses	• Food analysis theory • Food microbiology • Theory • Food chemistry theory • Laboratory code of practice • Food laboratory standards • Methods of sample collection • Sampling procedures • Development of laboratory manuals • Development of laboratory standard • operating procedures	• Written • Observation • Oral • Third party report
4. Carrying out raw materials and product analyses	• Food microbiology and analysis theory • Food chemistry • Types of food product analysis • Sample preparation • Interpretation and reporting of analyses results • Making decisions based on test outcomes and workplace standards	• Written • Observation • Oral • Third party report

Suggested Methods of Instruction
- Direct instruction
- Project
- Case studies
- Field/industrial trips
- Discussions
- Demonstration by trainer
- Practice by the trainee
- Industrial attachment

Recommended Resources
Laboratories:
- Food laboratory e.g., organoleptic, physical

- Food microbiological laboratory
- Analytical laboratory e.g., chemical analysis

Laboratory resources:
- Cold Room
- Clarifier
- Thermometer
- Analytical balance
- Homogenizer
- Pasteurizer
- Mixer
- Sealers
- Fryers
- Baking ovens
- Butter churn
- Mincer
- Knives
- Utensils
- Weighing scale
- Glassware
- Microscope
- Colony counter
- Blender
- Autoclave
- Refractometer
- Heating mantle
- Moisture analyzer
- Titration equipment
- HPLC
- Centrifuge
- Evaporator
- Fume chamber
- UV Spectrophotometer
- GLC
- PH Meter
- Consumables
- Incubator
- Reagents
- Dryers
- Computer

FOOD PRODUCTS PROCESSING

UNIT CODE: FOP/CU/FT/CR/02/6/A

Relationship to Occupational Standards
This unit addresses the unit of competency: Process food products

Duration of Unit: 480 hours

Unit Description
This unit specifies the competencies required to process food products. It involves preparing for food product processing; overseeing food product processing; documenting food processing activities and shutting down processing line.

Summary of Learning Outcomes
1. Preparing for food product processing
2. Overseeing food product processing
3. Documenting food processing activities
4. Shutting down processing line

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Preparing for food product processing	- Food engineering theory - Food microbiology - Technology of specific products - Food chemistry - Preparation of production schedules - Requisition of production materials - Preparation of production line - Test running the processing plant	- Written - Observation - Oral - Third party report
2. Overseeing food product processing	- Food chemistry (food additives) - Food product standards - Food processing parameters - Production resources - Following standard operating procedures - Supervision of process personnel - Product quality control and assurance - Monitoring product processing - Production efficiency	- Written tests - Observation - Oral - Third party report

	• Quality management systems (GMPs, • HACCP, ISO) • Packaging of processed products • Storing processed products • Managing and disposing food processing waste • Product rework and non-conformance handling • Product traceability	
3. Documenting food processing activities	• Keeping and maintaining production records • Keeping and maintaining production activities records • Keeping and maintaining production food safety and hygiene records • Keeping and maintaining production shift • handover records • Keeping and maintaining production dispatch records • Keeping and maintaining production processing personnel records • Preparation of food processing reports • Preparation of non-conformance records	• Written • Observation • Oral • Third party report
4. Shutting down processing line	• Shutdown procedures • Process line shutdown procedures • Preparation of process handover notes • Process line cleaning and sanitizing procedures • Emerging issues related to food processing • Plant and equipment maintenance	• Written • Observation • Oral • Third party report

Suggested Methods of Instruction
- Direct instruction
- Project
- Case studies
- Field trips
- Discussions
- Demonstration by trainer
- Practice by the trainee

- Industrial attachment

Recommended Resources
- An institution with a pilot processing plant
- An institution with an MOU of unlimited access of trainees to a processing plant
- Equipment related to technology of specific products

FOOD PROCESSING PLANT ANAGEMENT

UNIT CODE: FOP/CU/FT/CR/03/6/A

Relationship to Occupational Standards
This unit addresses the unit of competency: Manage food processing plants

Duration of Unit: 360 hours

Unit Description
This unit describes the competencies required to manage food processing plants. 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.

Summary of Learning Outcomes
1. Planning plant activities
2. Coordinating plant activities
3. Controlling plant activities
4. Managing plant personnel
5. Representing the plant in external fora

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Planning plant activities	- Feasibility studies - Project management - Principles of planning - Development of plant goals and objectives - Development and implementation of strategy towards the objective(s) - Identification of tasks for attainment of goals and objectives - Determination of required plant resources and resource mobilization - Development of implementation work - plans and schedules - Development of tools for monitoring and evaluation of plant performance (development of a strategic plan)	- Written - Observation - Oral - Third party report

2. Coordinating plant activities	• Development of plant organization structure • Plant resource determination and • allocation • Principles of procurement and • disposal of assets • Plant performance reporting • Inter-departmental relationship management	• Written • Observation • Oral • Third party report
3. Controlling plant activities	• Basic financial management • Tracking plant performance progress • Performance measurement • Performance analysis • Performance improvement • Monitoring of resources utilization	• Written • Observation • Oral • Third party report
4. Managing plant personnel	• Principles of human resource management • Management theories • Development of human resource policy • Recruitment, induction and deployment of staff • Supervision and appraisal of staff • Assessment of staff performance • Performance measurement • Management of staff performance • Determination and planning of staff training needs assessment • Training assessment • Staff capacity building • Staff compensation and motivation • Establishment of staff welfare programmes • Handling staff disciplinary and separation issues • Legal issues related to human resource management • Emerging issues related to management of human resource	• Written • Observation • Oral Third party report
5. Representing the plant in external fora	• Development of communication strategy	• Written • Observation • Oral

	• Handling external communications	• Third party report
	• Establishment and maintenance of	
	• stakeholders and partnership networks	
	• Management of adherence to plant legal and statutory requirements	
	• Consumer feedback management	

Suggested Methods of Instruction
- Direct instruction Project
- Case studies Field trips Discussions
- Demonstration by trainer
- Practice by the trainee Industrial attachment

Recommended Resources
- Computers Stationery
- Sample work plans
- Sample work schedules Sample budget
- Sample performance contracting documents Sample resource leveling sheets
- Sample communication policy
- Sample interview guides and schedules Sample capacity building programmes Case studies
- Sample human resource policies Sample M&E tools
- Sample strategic plan
- Sample organizational structures legal documents (Employment Act 2007, Food handlers' certificate, WIBA, NSSF, Taxation, NHIF, Public health Cap 242, OSHA, EMCA 1999 and Factories Act)

NEW FOOD PRODUCT DEVELOPMENT

UNIT CODE: FOP/CU/FT/CR/04/6/A

Relationship to Occupational Standards
This unit addresses the unit of competency: Develop new food products

Duration of Unit: 360 hours

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 analyzing 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.

Summary of Learning Outcomes
1. Conducting brainstorming sessions
2. Conducting new product feasibility studies
3. Developing and analyzing new product prototype
4. Market testing new product
5. Conducting new product tests
6. Introducing new product
7. Conducting competitor analysis

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Conducting brainstorming sessions	• Consumer complaints • Problem solving methodologies • Project management • Statistical analysis • Marketing intelligence	• Written • Observation • Oral • Third party report
2. Conducting new product feasibility studies	• Basic research methods • Development of new product feasibility study strategy • Identification of new product development resources • Budgeting and resource mobilization • Conducting new product feasibility studies • Preparation and presentation of	• Written • Observation • Oral • Third party report

	feasibility study report	
3. Developing and analyzing new product prototype	• Technology of specific products • Food chemistry • Food analysis • Food microbiology • Development of product prototype standards • Development of product prototype formula • Designing new product prototype processing procedure • Acquisition of resources for prototype • development • Development of product prototype samples • Laboratory analysis of product prototype • Documentation of development and analysis of prototype • Manage and dispose waste	• Written • Observation • Oral • Third party report
4. Market testing new product	• Development of product prototype marketing protocols • Development of product prototype marketing plan • Market testing product prototype • Conducting product prototype market • research • Preparation and documentation of • product prototype market research findings and recommendations	• Written • Observation • Oral • Third party report

5. Conduct new product tests	• New product legal and statutory requirements (Standards)
	• Product prototype improvement
	• Conducting laboratory tests on the improved prototype
	     • Elemental analysis
	     • Micro-bio analysis
	     • Rheological characteristics
	     • Sensory evaluation
	• Registration and patenting of new product
		• Written
		• Observation
		• Oral
		• Third party report

	• New product mass production • Packaging of new products • New product storage • Documentation of new product information, properties and process specifications	
6. Introducing new product	• Awareness training of staff • Preparation and presentation of new • product claim • Development of new product resourcing plan • Development of new product commercialization strategy • Development of new product quality • monitoring framework	• Written • Observation • Oral • Third party report
7. Conduct competitor analysis	• Competing products analysis • Product performance • Report preparation • Documentation of product performance and follow ups	• Written • Observation • Oral • Third party report

Suggested Methods of Instruction
- Direct instruction
- Project
- Case studies
- Field trips
- Discussions
- Demonstration by trainer
- Practice by the trainee
- Industrial attachment

Recommended Resources
Laboratories:
- Food laboratory
- Food microbiological laboratory
- Analytical laboratory

Laboratory resources:
- Cold Room

- Clarifier
- Thermometer
- Pasteurizer
- Mixer
- Sealers
- Fryers
- Baking ovens
- Butter churn
- Mincer
- Knives
- Utensils
- Analytical balance
- Homogenizer
- Weighing scale
- Glassware
- Microscope
- Colony counter
- Blender
- Autoclave
- Refractometer
- Heating mantle
- Moisture analyzer
- Titration equipment
- HPLC
- Centrifuge
- Evaporator
- Fume chamber
- UV Spectrophotometer
- GLC
- PH Meter
- Consumables
- Equipment related to technology of specific products