

**THE REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

**SOIL MANAGEMENT**

**LEVEL 5**



TVET CDACC

P.O BOX 15745-00100

NAIROBI

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**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 social economic development. Quality education and training will contribute to achievement Kenya’s development blue print and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution and this resulted to the formulation of the Policy Framework for Reforming Education and Training. A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

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

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

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

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

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need toreform 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 Soil Sector Skills Advisory Committee (SSAC) have developed this curriculum.

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

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

I am grateful to the Council Members, Council Secretariat, Soil 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 SSAC in ensuring that competencies required by the industry are addressed in this curriculum. I also thank GIZ) Soil Protection and Rehabilitation for Food Security) and all stakeholders in the Soil 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 Soil sector will acquire competencies that will enable them to perform their work more efficiently.

**COUNCIL SECRETARY/CEO**

**TVET CDACC**

## 

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# **ACRONYMNS AND ABBREVIATIONS**

CDACC Curriculum Development, Assessment and Certification Council

CU Curriculum

SL Soil

SM Soil management

BC Basic competency

CC Common competency

CR Core competency

ISO International Organization for Standardization

K.C.S.E Kenya Certificate of Secondary Education

KNQA Kenya National Qualification Authority

KNQF Kenya National Qualification Framework

OHSAS Occupational Health and Safety Assessment Series

PPE Personal Protective Equipment

SOP Standard Operating Procedures

TVET Technical and Vocational Education and Training

IPM Integrated pest management

CA Conservation agriculture

ISFM Integrated soil fertility management

GAP Good agricultural practices

EMCA Environmental management and co-ordination Act

NEMA National Environmental Management Authority

DoA Department of Agriculture

# 

# KEY TO UNIT CODE

SL/ CU/ SM/ BC /01 /5/ A

Industry or sector

Curriculum

Occupational area

Type of Unit

Unit number

Competency level

Version control

# COURSE OVERVIEW

**Description of the course**

This course is designed to equip individuals with competencies required for soil fertility management, conservation agriculture, agroforestry, agricultural pests, diseases and weed management and soil and water conservation

The course consists of basic and core units of learning as indicated below:

**Basic Units of Learning**

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

**Common Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in hrs** | **CREDIT FACTORS** |
| SL/CU/SM/CC/01/5/A | Principles of Agriculture | 120 | 12 |
|  | **Total** | 120 | 12 |

**Core units of learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **CREDIT FACTORS** |
| SL/CU/SM/CR/01/5/A | Soil fertility management | 120 | 12 |
| SL/CU/SM/CR/02/5/A | Conservation Agriculture | 70 | 7 |
| SL/CU/SM/CR/03/5/A | Agroforestry | 70 | 7 |
| SL/CU/SM/CR/04/5/A | Agricultural pests, diseases and weed management | 30 | 3 |
| SL/CU/SM/CR/05/5/A | Soil and water conservation | 150 | 15 |
|  | Industrial attachment | 360 | 36 |
|  | **Total** | 800 | 80 |
| **GRAND TOTAL** | | **1200** | **120** |

The core units of learning are independent of each other and may be taken independently.

The total duration for this course **is 1200** hours including industrial attachment.

**Industrial attachment**

It is envisaged that the trainee will have undergone an industrial training and assessment with a recognised industry as a prerequisite for completion of this training course.

An individual enrolled in this course will be required to undergo a two-month industrial attachment with the relevant competency required

**Entry Requirements**

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

1. Kenya Certificate of Secondary Education (K.C.S.E.) with a minimum mean grade of D (Plain)

**Or**

1. Soil Management Technician Level 4 certificate

**Or**

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

**Trainer qualification**

A trainer for this course should have a higher qualification than the level of this course

**Assessment**

The course will be assessed at two levels: internally and externally. Internal assessment is continuous and is conducted by the trainer who is monitored by an internal accredited verifier while external assessment is the responsibility of TVET/CDACC.

**Certification**

A candidate will be issued with a Certificate of competency on demonstration of competence in a unit of competency. To attain the qualification Soil Management Level 5, the candidate must demonstrate competence in all the units of competency as given in qualification pack. These certificates will be issued by TVET CDACC in conjunction with training provider.

# BASIC UNITS OF LEARNING

# 

**COMMUNICATION SKILLS**

**UNIT CODE:** SL/CU/SM/BC/01/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Communication Skills

**Duration of Unit:** 25hours

**Unit Description**

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

**Summary of Learning Outcomes**

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

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Meet communication needs of clients and colleagues | * Communication process * Modes of communication * Medium of communication * Effective communication * Barriers to communication * Flow of communication * Sources of information * Organizational policies * Organization requirements for written and electronic communication methods * Report writing * Effective questioning techniques (clarifying and probing) * Workplace etiquette * Ethical work practices in handling communication * Active listening * Feedback * Interpretation * Flexibility in communication | * Interview * Third party reports * Written texts |
| 1. Contribute to the development of communication strategies | * Dynamics of groups * Styles of group leadership * Openness and flexibility in communication * Communication skills relevant to client groups | * Written * Observation |
| 1. Conduct interviews | * Types of interview * Establishing rapport * Facilitating resolution of issues * Developing action plans | * Written * Observation |
| 1. Facilitate group discussions | * Identification of communication needs * Dynamics of groups * Styles of group leadership * Presentation of information * Encouraging group members participation * Evaluating group communication strategies | * Written * Observation |
| 1. Represent the organization | * Presentation techniques * Development of a presentation * Multi-media utilization in presentation * Communication skills relevant to client groups | * Observation * Written |

**Suggested Methods of Instruction**

* Role playing
* Viewing of related videos

**Recommended Resources**

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

**NUMERACY SKILLS**

**UNIT CODE:** SL/CU/SM/BC/02/5/A

**Relationship to Occupational Standards:**

This unit addresses the Unit of Competency: Demonstrate Numeracy Skills

**Duration of Unit:** 40 hours

**Unit Description**

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

**Summary of Learning Outcomes**

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

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

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

**Suggested Methods of Instruction**

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

**Recommended resources**

* Calculators
* Basic measuring instruments

**DIGITAL LITERACY**

**UNIT CODE:** SL/CU/SM/BC/03/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Digital Literacy

**Duration of Unit:** 45 hours

**Unit Description**

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

**Summary of Learning Outcomes**

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

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

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

**Suggested Methods of Instruction**

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

**Recommended Resources**

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

**ENTREPRENEURIAL SKILLS**

**UNIT CODE:** SL/CU/SM/BC/04/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Entrepreneurship

**Duration of unit:** 70 hours

**Unit Description**

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

**Summary of Learning Outcomes**

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

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

**Suggested Methods of Instruction**

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

**Recommended Resources**

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

**EMPLOYABILITY SKILLS**

**UNIT CODE:** SL/CU/SM/BC/05/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Employability Skills

**Duration of Unit:** 50 hours

**Unit Description**

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

**Summary of Learning Outcomes**

1. Conduct self-management

2. Demonstrate interpersonal communication

3. Demonstrate critical safe work habits

4. Lead small teams

5. Plan and organize work

6. Maintain professional growth and development

7. Demonstrate workplace learning

8. Demonstrate problem solving skills

9. Demonstrate workplace ethics

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Conduct self-management | 1. Self-awareness 2. Formulating personal vision, mission and goals 3. Strategies for overcoming life challenges 4. Emotional intelligence 5. Assertiveness versus aggressiveness 6. Expressing personal thoughts, feelings and beliefs 7. Developing and maintaining high self-esteem 8. Developing and maintaining positive self-image 9. Articulating ideas and aspirations 10. Accountability and responsibility 11. Good work habits 12. Self-awareness 13. Self-development 14. Financial literacy 15. Healthy lifestyle practices | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Demonstrate interpersonal communication | 1. Meaning of interpersonal communication 2. Listening skills 3. Types of audience 4. Writing skills 5. Reading skills 6. Meaning of empathy 7. Understanding customers’ needs 8. Establishing communication networks 9. Sharing information | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Demonstrate critical safe work habits | 1. Stress and stress management 2. Punctuality and time consciousness 3. Leisure 4. Integratingpersonal objectives into organizational objectives 5. Resources utilization 6. Setting work priorities 7. HIV and AIDS 8. Drug and substance abuse 9. Handling emerging issues | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Lead a small team | 1. Leadership qualities 2. Team building 3. Determination of team roles and objectives 4. Team performance indicators 5. Responsibilities in a team 6. Forms of communication 7. Complementing team activities 8. Gender and gender mainstreaming 9. Human rights 10. Maintaining relationships 11. Conflicts and conflict resolution | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Plan and organize work | 1. Functions of management  * Planning * Organizing  1. Time management 2. Decision making process 3. Task allocation 4. Evaluating work activities 5. Resource utilization 6. Problem solving 7. Collecting and organising information | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Maintain professional growth and development | 1. Opportunities for professional growth 2. Assessing training needs 3. Licenses and certifications for professional growth and development 4. Pursuing personal and organizational goals 5. Identifying work priorities 6. Recognizing career advancement | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Demonstrate workplace learning | 1. Managing own learning 2. Contributing to the learning community at the workplace 3. Cultural aspects of work 4. Variety of learning context 5. Application of learning 6. Safe use of technology 7. Identifying opportunities 8. Generating new ideas 9. Workplace innovation 10. Performance improvement 11. Handling emerging issues 12. Future trends and concerns in learning | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Demonstrate problem solving skills | 1. Problem identification 2. Problem solving 3. Application of problem-solving strategies 4. Resolving customer concerns | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |
| 1. Demonstrate workplace ethics | 1. Meaning of ethics 2. Ethical perspectives 3. Principles of ethics 4. Values and beliefs 5. Ethical standards 6. Organization code of ethics 7. Common ethical dilemmas 8. Organization culture 9. Corruption, bribery and conflict of interest 10. Privacy and data protection 11. Diversity, harassment and mutual respect 12. Financial responsibility/accountability 13. Etiquette 14. Personal and professional integrity 15. Commitment to jurisdictional laws 16. Emerging issues in ethics | 1. Written tests 2. Oral questioning 3. Interviewing 4. Portfolio of evidence 5. Third party report |

**Suggested Methods of Instruction**

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

**Recommended Resources**

1. Computers
2. Stationery
3. Charts
4. Video clips
5. Audio tapes
6. Radio sets
7. TV sets
8. LCD projectors

**ENVIRONMENTAL LITERACY**

**UNIT CODE:** SL/CU/SM/BC/06/5

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Environmental Literacy

**Duration of Unit:** 25 hours

**Unit Description**

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

**Summary of Learning Outcomes**

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

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Control environmental hazards | * Purposes and content of Environmental Management and Coordination Act 1999 * Purposes and content of Solid Waste Act * Storage methods for environmentally hazardous materials * Disposal methods of hazardous wastes * Types and uses of PPE in line with environmental regulations * Occupational Safety and Health Standards (OSHS) | * Written test * Oral questions * Observation |
| 1. Control environmental Pollution control | * Types of pollution * Environmental pollution control measures * Types of solid wastes * Procedures for solid waste management * Different types of noise pollution * Methods for minimizing noise pollution | * Written test * Oral questions * Observation |
| 1. Demonstrate sustainable resource use | * Types of resources * Techniques in measuring current usage of resources * Calculating current usage of resources * Methods for minimizing wastage * Waste management procedures * Principles of 3Rs (Reduce, Reuse, Recycle) * Methods for economizing or reducing resource consumption | * Written test * Oral questions * Observation |
| 1. Evaluate current practices in relation to resource usage | * Collection of information on environmental and resource efficiency systems and procedures, * Measurement and recording of current resource usage * Analysis and recording of current purchasing strategies. * Analysis of current work processes to access information and data * Identification of areas for improvement | * Written test * Oral questions * Observation |
| 1. Identify Environmental legislations/conventions for environmental concerns | * Environmental issues/concerns * Environmental legislations /conventions and local ordinances * Industrial standard /environmental practices * International Environmental Protocols (Montreal, Kyoto) * Features of an environmental strategy | * Written questions * Oral questions * Observation |
| 1. Implement specific environmental programs | * Community needs and expectations * Resource availability * 5 s of good housekeeping * Identification of programs/Activities * Setting of individual roles /responsibilities * Resolving problems /constraints encountered * Consultation with stakeholders | * Written questions * Oral questions * Observation |
| 1. Monitor activities on Environmental protection/Programs | * Periodic monitoring and Evaluation of activities * Gathering feedback from stakeholders * Analysing data gathered * Documentation of recommendations and submission * Setting of management support systems to sustain and enhance the program * Monitoring and reporting of environmental incidents to concerned /proper authorities | * Oral questions * Written tests * Practical test * Observation |

**Suggested Methods of Instruction**

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

**Recommended Resources**

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

**OCCUPATIONAL SAFETY AND HEALTH PRACTICES**

**UNIT CODE:** SL/CU/SM/BC/07/5

**Relationship to Occupational Standards**

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

**Duration of Unit:** 25 hours

**Unit Description**

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

**Summary of Learning Outcomes**

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

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

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

**Suggested Methods of Instruction**

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

**Recommended Resources**

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

# COMMON UNITS OF LEARNING

## PRINCIPLES OF AGRICULTURE

**UNIT CODE:** SL/CU/SM/CC/01/5

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply principles of agriculture.

**Duration of Unit:**  120 hours

**Unit Description**

This unit describes the competencies required to apply principles of agriculture.it involves implementing farm plans, utilizing weather information systems, performing enterprise cost benefit analysis, managing livestock, crops, keeping agricultural records and sensitizing community

**Summary of Learning Outcomes**

* + - 1. Implement farm plans
      2. Utilize weather information systems
      3. Perform enterprise cost benefit analysis
      4. Manage livestock
      5. Manage crops
      6. Keep agricultural records
      7. Sensitize community

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Methods of Assessment** |
| 1. Implement farm plans | * Meaning of farm plan * Purpose of farm plan * Selection of farm enterprises * Farm business plan * Farm layout * Farm budget * Farm records | * Observation * Oral questioning * Written tests * Projects |
| * 1. Utilize weather information systems | * Meaning of weather information systems * Purpose of weather information systems * Sources of weather information * Development of cropping calendar * Early warning systems * Weather instruments * Adaptation to climate change. * Mitigation measures to climate change. | * Observation * Oral questioning * Written tests * Projects |
| * 1. Perform enterprise cost benefit analysis | * Meaning of cost benefit analysis * Purpose of cost benefit analysis * Types of costs * Types of benefits * Determination of gross margin * Cost benefit analysis report | * Observation * Oral questioning * Written tests * Projects |
| * 1. Manage livestock | * Purpose of livestock management * Types of livestock * Livestock management systems   + free range   + intensive   + semi intensive * Livestock breeds * Livestock feeds and fodder * Disease and pest management * Livestock productivity * Management of livestock manure | * Observation * Oral questioning * Written tests * Projects |
| * 1. Manage crops | * Plant varieties * Soil sampling and analysis * Importance of plants on soil fertility * Plant nutrition * Establishment and management of plants * Plant diseases and pests * Management of plant diseases and pests * Plant harvesting and post-harvest handling | * Observation * Oral questioning * Written tests * Projects |
| * 1. Keep agricultural records | * Purpose of record keeping * Types of records * Development of record templates * Data entry and analysis * Storage of records | * Observation * Oral questioning * Written tests * Projects |
| * 1. Sensitize community | * Meaning of community * Types of community stakeholders * Purpose of community sensitization * Stakeholder analysis and selection * Community mobilization   + Media   + Invitation letters   + Road shows   + Barazas * Sensitization of community * Report preparation and dissemination | * Observation * Oral questioning * Written tests * Projects |

**Suggested Methods of instructions**

* Group discussions
* Lectures
* Demonstration by trainer
* Field trips
* Industrial attachment
* Projects
* Practicals
* Exercises by trainee

**Recommended Resources**

* Farm tools and equipment
* Demo plots
* Agrochemicals
* Surveying tools
* Weather information systems
* Weather instruments
* Farm structures
* Cabinets
* Transport
* Public address systems
* Media
* Calculators
* Stationery
* Computers with internet connection

## CORE UNITS OF LEARNING

## SOIL FERTILITY MANAGEMENT

**UNIT CODE:** SL/CU/SM/CR/01/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Manage soil fertility

**Duration of Unit:**  120 hours

**Unit Description**

This unit describes the competencies required to manage soil fertility. It involves, collecting soil samples, collecting plant tissue samples, managing on farm residues, applying inorganic fertilizer and amending soil pH.

**Summary of Learning Outcomes**

* + 1. Analyze soil samples
    2. Analyze plant tissue
    3. Manage on-farm residues
    4. Prepare organic manure
    5. Apply fertilizer
    6. Amend soil pH
    7. Apply ISFM

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Methods of Assessment** |
| * 1. Collect soil samples | * Meaning of soil * Types of soils * Components of soil * Soil nutrients * Indicators of soil nutrient deficiency * Meaning and Purpose of soil analysis * Meaning and importance of soil fertility * Soil characterization * Soil sampling techniques * Soil sample processing * Instruments for soil sampling * Record keeping | * Observation * Oral questioning * Written tests * Projects |
| * 1. Collect plant tissue | * Meaning of plant tissue * Purpose of plant tissue analysis * Types of plant tissues * Sampling techniques * Instruments for plant tissue sampling * Sample processing * Record keeping | * Observation * Oral questioning * Written tests * Projects |
| * 1. Manage on-farm residues | * Types of on-farm residues * Uses of on farm residues * Processing of farm residues for livestock feeds * Meaning of animal manure   + Types   + Management * Biogas preparation | * Observation * Oral questioning * Written tests * Projects |
| * 1. Prepare organic manure | * Meaning and importance of organic manure * Types of organic manure   + Compost manure   + Farmyard manure   + Liquid organic manure   + Green manure   + Vermi-compost * Preparation of organic manure * Management of organic manure * Application of organic manure | * Observation * Oral questioning * Written tests * Projects |
| * 1. Apply fertilizer | * Meaning of fertilizers * Purpose of fertilizers * Types of fertilizers * Fertilizer grades and quality * Plant nutrient requirements * Fertilizer application   + Methods of fertilizer application   + Time of application   + Application rates * Effects of fertilizers on the environment. * Safe handling of fertilizers   + Transportation   + Application   + Storage   + Disposal * Mixing fertilizers | * Observation * Oral questioning * Written tests * Projects |
| * 1. Amend soil pH | * Meaning of soil pH * Methods of soil pH testing * Factors that influence soil pH * Soil pH correction measures   + Management of acidic soils   + Management of alkaline soils | * Observation * Oral questioning * Written tests * Projects |
| * 1. Apply integrated soil fertility management (ISFM) | * Meaning of ISFM * Benefits of ISFM * Combinations of organic and Inorganic fertilizers * Merits and demerits of organic manures/inorganic fertilizers * Methods of application * Evaluation of ISFM performance. | * Observation * Oral questioning * Written tests * Projects |

**Suggested Methods of instruction**

* Group discussions
* Lectures
* Demonstration by trainer
* Field trips
* Industrial attachment
* Outreach programs
* Projects
* Practicals
* Exercises by trainee

**Recommended Resources**

* Well-equipped Laboratories
* Sampling tools and equipment
* Sampling area
* Fertilizers
* Protective gear
* Shredders
* Chaff cutters
* Scientific Calculators
* Rulers, pencils, erasers
* Charts with presentations of data
* Computers with internet connection

## CONSERVATION AGRICULTURE

**UNIT CODE:** SL/CU/SM/CR/02/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply conservation agriculture

**Duration of Unit:** 70 hours

**Unit Description**

This unit describes the competencies required to apply conservation agriculture. It involves performing conservation tillage, establishing permanent soil cover, crop rotation, conserving soil biodiversity, managing on-farm residues and conserving plant diversity.

**Summary of Learning Outcomes**

* + - 1. Perform conservation tillage
      2. Establish permanent soil cover
      3. Perform crop rotation
      4. Conserve soil biodiversity
      5. Manage on-farm residues
      6. Conserve plant diversity

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Methods of Assessment** |
| * 1. Perform conservation tillage | * Principles of conservation agriculture * Difference between conservation agriculture and conventional agriculture   + Advantages and disadvantages * Meaning of conservation tillage * Purpose of conservation tillage * Conservation tillage practices   + Zero tillage   + Minimum tillage * Tools and equipment for conservation tillage | * Observation * Oral questioning * Written tests * Projects |
| * 1. Establish permanent soil cover | * Meaning of permanent soil cover * Purpose of soil cover * Types of soil cover   + Mulch   + Cover crops * Establishment and management of cover crops * Tools and equipment | * Observation * Oral questioning * Written tests * Projects |
| * 1. Perform crop rotation | * Meaning of crop rotation * Purpose of crop rotation * Crop types and varieties * Crop rotation plan * Implementation of crop rotation plan | * Observation * Oral questioning * Written tests * Projects |
| * 1. Conserve soil biodiversity | * Meaning of soil biodiversity * Importance of soil biodiversity * Factors affecting soil biodiversity   + Biotic factors   + Abiotic factors * Methods of conserving soil biodiversity | * Observation * Oral questioning * Written tests * Projects |
| * 1. Manage on-farm residues | * Types of on-farm residues * Uses of on farm residues * Animal manure   + Types   + Collection   + Management * Biogas preparation * Compost manure   + Preparation   + Application   + Management | * Observation * Oral questioning * Written tests * Projects |
| * 1. Conserve plant diversity | * Meaning of plant diversity * Purpose and importance of conservation of plant diversity * Methods of conserving plant diversity * Factors affecting plant diversity. | * Observation * Oral questioning * Written tests   Projects |

**Suggested Methods of instruction**

* Group discussions
* Lectures
* Demonstration by trainer
* Field trips
* Industrial attachment
* Outreach programs
* Projects
* Practicals
* Exercises by trainee

**Recommended Resources**

* Assorted seeds
* Demo plots
* Farm tools and equipment
* Protective gear
* Cold rooms
* Stationery
* Botanical gardens
* Arboretum
* Computers with internet connection

## AGROFORESTRY

**UNIT CODE:** SL/CU/SM/CR/03/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply agroforestry

**Duration of Unit:** 70 hours

**Unit Description**

This unit describes the competencies required to apply agroforestry. It involves managing tree seeds, establishing tree nursery, improving tree productivity, and establishing agroforestry system

**Summary of Learning Outcomes**

* + - 1. Establish agroforestry system
      2. Manage tree seeds
      3. Establish tree nursery,
      4. Improve tree productivity

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Methods of Assessment** |
| * + - 1. Establish agroforestry system | * Meaning of agroforestry * Importance of agroforestry * Types of agroforestry systems * Farm layout * Tree and crop/animal selection * Management of agroforestry systems   + Agro-silviculture   + Agro-silvopastoralism   + Aqua-silviculture   + Apiculture with forestry   + Silvo-entomology * Utilization of agroforestry products * Value addition * Post-harvest handling of the agroforestry produces and products * Record keeping * Marketing | * Observation * Oral questioning * Written tests * Projects |
| 1. Manage tree seeds | * Types of seeds * Seed dormancy * Sources of tree seeds * Seed longevity * Methods of seed collection and handling * Processing of seeds   + Extraction   + Drying   + Cleaning   + Sorting   + Pretreatment   + Seed dressing * Storage of seeds | * Observation * Oral questioning * Written tests * Projects |
| 1. Establish tree nursery | * Meaning of tree nursery * Importance and purpose of tree nurseries * Certification of tree nursery * Tree species * Site selection * Preparation of potting media * Potting materials * Procedure of potting * Seed bed preparation * Types of seed beds * Seed dormancy * Seed viability * Seed sowing * Pricking out seedlings * Management of tree nursery   + Shading   + Watering   + Root pruning   + Weeding   + Hardening up   + Transplanting * Pest and disease management * Record keeping * Marketing | * Observation * Oral questioning * Written tests * Projects |
| 1. Improve tree productivity | * Meaning of tree productivity * Tree management aspects * Economics of agroforestry * Importance of tree productivity * Methods of improving tree productivity   + Grafting   + Budding   + Cloning   + Top working   + Pruning   + Layering   + Pollarding   + Coppicing | * Observation * Oral questioning * Written tests * Projects |

**Suggested Methods of instruction**

* Group discussions
* Lectures
* Demonstration by trainer
* Field trips
* Industrial attachment
* Projects
* Outreach programs
* Practicals
* Exercises by trainee

**Recommended Resources**

* Tree seeds
* Potting materials
* Nursery tools and equipment
* Agrochemicals
* Shade nets
* Greenhouses
* Water source
* Stationery
* Ladders
* Seed collection equipment

## AGRICULTURAL PESTS DISEASES AND WEED MANAGEMENT

## 

**UNIT CODE:** SL/CU/SM/CR/04/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Manage agricultural pests, diseases and weeds

**Duration of Unit: 30** hours

**Unit Description**

This unit describes the competencies required to manage agricultural pests, diseases and weeds. It involves use of agro-chemicals safely, controlling pests, diseases and weeds

**Summary of Learning Outcomes**

1. Apply agrochemicals safely
2. Manage pests and diseases
3. Manage weeds

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| * 1. Apply agrochemicals safely | * Types of agrochemicals * Impacts of agrochemicals on the environment * PPEs * Handling agrochemicals   + Transportation   + Storage   + Application   + Disposal * Preparation of agrochemicals   + Application rates   + Calibration   + Compatibility * User precautions | * Observation * Oral questioning * Written tests * Projects |
| * 1. Manage pests and diseases | * Meaning of pests and diseases * Importance of managing pests and diseases in relation to soil health * Types of pests and diseases * Predisposing factors * Integrated pests and disease management   + Identification of pests   + Scouting   + Methods of control | * Observation * Oral questioning * Written tests * Projects |
| * 1. Manage weeds | * Meaning of weeds * Economic importance of weeds * Types of weeds * Methods of weed management   + Cultural   + Mechanical   + Biological   + Chemical   + Integrated | * Observation * Oral questioning * Written tests * Projects |

**Suggested Delivery Methods**

* Group discussions
* Lectures
* Case studies
* Demonstration by trainer
* Field trips
* Industrial attachment
* Outreach programs
* Projects
* Practicals
* Exercises by trainee

**Recommended Resources**

* Agrochemicals
* Farm tools and equipment
* Demo plots
* Protective gear
* Stationery
* Computers with internet connection

## SOIL AND WATER CONSERVATION

**UNIT CODE:** SL/CU/SM/CR/05/5/A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Conserve soil and water

**Duration of Unit:**  150 hours

**Unit Description**

This unit describes the competencies required to conserve soil and water.it involves controlling soil erosion, establishing cross slope barriers, reinforcing embankments, harvesting water, rehabilitating degraded lands, establishing soil cover, and establishing irrigation and drainage systems

**Summary of Learning Outcomes**

* + - 1. Control soil erosion
      2. Establish cross slope barriers
      3. Reinforce embankments
      4. Establish soil cover
      5. Harvest water
      6. Establish irrigation systems
      7. Establish drainage systems
      8. Rehabilitate degraded lands
      9. Control water pollution

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Methods of Assessment** |
| * + - 1. Control soil erosion | * Meaning of soil erosion * Purpose of controlling soil erosion * Types of soil erosion * Causes of soil erosion * Methods of controlling soil erosion | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Establish cross slope barriers | * Meaning of cross slope barriers * Purpose of cross slope barriers * Types of cross slope barriers * Design of cross slope barriers * Laying of contours * Construction of cross slope barriers   + Terraces   + Trash lines   + Grass strips   + Stone lines   + Check dams   + Retention ditches   + Gabions   + Cut off drains * Maintenance of cross slope barriers | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Reinforce embankments | * Types of embankments * Purpose of reinforcing embankments * Methods of reinforcing embankments | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Establish soil cover | * Meaning of soil cover * Purpose of soil cover * Types of soil cover * Establishment of soil cover   + Mulch   + Cover crops * Management of soil cover | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Harvest water | * Meaning of water harvesting * Purpose of water harvesting * Water harvesting techniques   + Roof catchments   + Rock catchments   + Mitre drains * Types of water harvesting structures   + Earth dams   + Sand dams   + Water pans   + Farm ponds   + Tanks   + Cisterns   + Zai pits   + Trapezoidal bunds   + Semi-circular bunds   + Retention ditches   + Boreholes   + Wells * Construction of water harvesting structures * Maintenance of water harvesting structures. | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Rehabilitate degraded lands | * Meaning of soil and water conservation * Importance of soil and water conservation * Meaning of land degradation * Causes of land degradation * Indicators of land degradation * Types of land degradation * Importance of land rehabilitation * Methods of land rehabilitation * Regeneration of natural vegetation * Controlled grazing * Improve soil health   + Manuring   + Composting   + Fallowing | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Establish irrigation systems | * Meaning of irrigation * Purpose of irrigation * Types of irrigation systems * Factors influencing choice of irrigation system and design * Crop water requirements * Layout of irrigation systems * Installation of irrigation systems   + Drip   + Sprinkler   + Furrow   + Flood   + Basin * Maintenance of irrigation systems | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Establish drainage systems | * Meaning of drainage * Purpose of drainage * Types of drainage systems * Factors influencing choice of drainage system and design * Layout of drainage systems * Installation of drainage systems   + Surface   + Sub-surface * Maintenance of drainage systems | * Observation * Oral questioning * Written tests * Projects |
| * + - 1. Control water pollution | * Sources of soil pollution * Determination of soil pollution level * Treatment of polluted soil * Soil pollution control measures * Environmental regulations (EMCA) | * Observation * Oral questioning * Written tests * Projects |

**Suggested Methods of instruction**

* Group discussions
* Lectures
* Case studies
* Demonstration by trainer
* Field trips
* Industrial attachment
* Outreach programs
* Projects
* Practicals
* Exercises by trainee

**Recommended Resources**

* Farm tools
* Demo plots
* Protective gear
* Irrigation kits
* Water source
* Surveying tools and equipment
* Stationery
* Computers with internet connection