REPUBLIC OF KENYA

COMPETENCY BASED MODULAR CURRICULUM

FOR

AGRICULTURAL ENGINEERING

KNQF LEVEL 6

(CYCLE 3)

PROGRAMME ISCED CODE: 0716 554 A

TVET CDACC
P.O. BOX 15745-00100
NAIROBI

SOIL MECHANICS PRINCIPLES

UNIT CODE: 0716 541 23A

TVET CDACC UNIT CODE: ENG/CU/AGR/CC/06/6/MA

Duration of Unit: 100 hours

Relationship to Occupational Standards

This unit addresses the unit of competency: **Apply soil mechanics principles**

Unit Description

This unit describes the competencies required by an Agricultural Engineering Technologist Level 6 in order to apply soil mechanics principles. It involves conducting site feasibility study, carrying out soil tests and analyzing and interpreting soil test data.

Summary of Learning Outcomes

S/No.	Learning Outcomes	Duration (Hours)
1.	Conduct site feasibility study	**10**
2.	Carry out soil tests	**80**
3.	Analyse and interpret soil test data	**10**
TOTAL		**100**

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1 Conduct site feasibility study	1.1 Factors to be considered in conducting feasibility survey 1.1.1 Site location 1.1.2 Clients' requirements 1.2 Planning for feasibility survey 1.2.1 Tools and equipment for feasibility survey 1.2.2 Types of feasibility surveys 1.2.3 Procedures for feasibility survey	• Practical • Project • Portfolio of evidence • Third party report • Written tests • Oral questioning

Learning Outcome	Content	Suggested Assessment Methods
	1.3 Preparation of feasibility study report	
2 Carry out soil tests	2.1 Types of soil sampling tools and equipment 2.2 Soil sampling methods 2.2.1 Random 2.2.2 Stratified 2.2.3 Systematic 2.2.4 Zone 2.2.5 W-sampling 2.3 Taking a representative sample 2.3.1 Accuracy 2.3.2 Precision 2.3.3 Random error 2.4 Soil sampling procedures 2.4.1 Field layout 2.4.2 Sample collection 2.4.3 Compositing 2.4.4 Packaging 2.4.5 Processing 2.4.6 Storage 2.5 Soil sample preparation and processing 2.5.1 Drying 2.5.2 Size reduction 2.5.3 Decontamination 2.6 Classification of soil test 2.6.1 Insitu soil test	o Practical o Project o Portfolio of evidence o Third party report o Written tests o Oral questioning

Learning Outcome	Content	Suggested Assessment Methods
	2.6.2 Laboratory soil test 2.7 Soil test parameters 2.7.1 Proctor tests 2.7.2 Liquid limit 2.7.3 Plastic index 2.7.4 Shear strength 2.7.5 Aggregate stability 2.7.6 Texture 2.7.7 Particle density 2.8 Soil test procedures and methods	
3 Analyse and interpret soil test data	3.1 Soil test data analysis procedure 3.2 Interpretation of soil test data 3.3 Application of soil test data in engineering tasks	• Practical • Project • Portfolio of evidence • Third party report • Written tests • Oral questioning

Suggested Methods of Delivery

- Demonstration
- Projects
- Group discussion
- Direct instructions

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)

A	**Learning Materials**			
	Projector		1	1:25
	Soil survey and classification manual		1	1:25
	Scientific calculators		25	1:25
	Computer with internet		1	1:25
B	**Learning Facilities & infrastructure**			
	Classroom	40 M^2	1	1:25
C	**Consumable materials**			
	Stationery	Assorted	1 rim of printing papers 1 packet of pens 1packet of maker pens	1:25
D	**Tools and Equipment**			
	GPS device		1 pc	1:25
	Sampling bags		100pc	1:4
	Augers		5 pcs	1:5
	Composite sample buckets		5 pcs	1:5
	Slashers		5 pcs	1:5
	Pangas		5 pcs	1:5