REPUBLIC OF KENYA

COMPETENCY-BASED MODULAR CURRICULUM

FOR

AGRICULTURE AND EXTENSION LEVEL 6
(CYCLE 3)

ISCED PROGRAMME CODE: 0811 554 A

TVET CDACC
P.O. BOX 15745-00100 NAIROBI

GENETIC PRINCIPLES

UNIT CODE: 0811 551 22A

TVET CDACC UNIT CODE: AGR/CU/EXT/CC/04/6/MA

UNIT DURATION: 100 HOURS

Relationship to Occupational Standards

This unit addresses the Unit of Competency: **Apply knowledge of genetics concepts**

Unit Description

This unit covers knowledge, skills and attitudes required to apply genetic concepts. It involves applying Mendelian and chromosomal theories and applying selection principles in animal production.

Summary of Learning Outcomes

By the end of this unit, the learner should be able to:

S/No	Learning Outcomes	Duration (Hours)
1.	Apply chromosomal theory	30
2.	Apply mendelian theory	40
3.	Apply selection principles	30
Total		**100**

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcomes	Content	Suggested Assessment Methods
3. To apply chromosomal theory	**Theory** 1.1 Chromosomal theory 1.1.1 Introduction to genetics 1.1.2 Definition of terminologies: 1.1.2.1 Genetics	• Written tests • Third party report • Reflection papers • Projects • Interviews/ Oral

	1.1.2.2 Breeding 1.1.3 Qualitative genetics 1.1.4 Genetic material 1.1.5 Mutations and Chromosomal aberrations 1.1.6 Quantitative Genetics 1.1.7 Cell division stages 1.1.7.1 Interphase 1.1.7.2 Prophase 1.1.7.3 Metaphase 1.1.7.4 Anaphase 1.1.7.5 Telophase	questions • Workshop reports • Individual/group assignments • Case Studies • Practical

2 To apply mendelian theory	**Theory** 2.1 Mendelian theory 2.1.1 Concept of variations 2.1.2 Monohybrid inheritance 2.1.3 Dihybrid inheritance 2.1.4 Complete and incomplete dominance 2.1.5 Co-dominance 2.1.5.1 Phenotypic and genotypic frequencies	• Written tests • Third party report • Reflection papers • Projects • Interviews/ Oral questions • Workshop reports • Individual/group assignments • Case Studies • Practicals
3 To apply selection principles	**Theory** 3.1 Selection principles 3.1.1Theory of selection 3.1.2 Selection methods 3.1.2.1 Tandem 3.1.2.2 Family 3.1.2.3 Pedigree 3.1.2.4 Contemporary	• Written tests • Third party report • Reflection papers • Projects • Interviews/ Oral questions • Workshop reports • Individual/group

	3.1.3 Livestock breeding system 3.1.3.1 close breeding 3.1.3.2 Line breeding 3.1.3.3 cross breeding 3.1.3.4 Top crossing 3.1.3.4 UP-grading 3.1.3.6 Special hybridization 3.1.4 Breeding methods 3.1.4.1 Natural mating 3.1.4.2 Embryo transplant 3.1.4.3 Artificial insemination 3.1.5 Breeding superior livestock	assignments • Case Studies • Practicals

Suggested Methods of Instruction

- Role playing
- Group discussion
- Direct instruction
- Demostration

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	**Learning Materials**			
25.	Books	Principles of Genetics	5 pcs	1:5
26.	writing materials		50	2:1
27.	Charts	Chromosomal behaviour during cell division	1	1:25
28.	PowerPoint presentations	For trainer's use		
29.	Whiteboard		1	1:25

30.	Assorted color of whiteboard markers	For trainer's use		
31.	Printers		1	1:25
32.	Projector		1	1:25
B	**Learning Facilities & infrastructure**			
8.	Lecture/theory room		1	1:25
9.	Genetics lab		1	1:25