## GENETICS

**UNIT CODE:** 0511 551 08 A

**TVET CDACC UNIT CODE:** AGR/CU/AP/CC/03/6/MA

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply genetics

**DURATION OF UNIT: 80 Hours**

**UNIT DESCRIPTION**

This unit describes knowledge, skills and attitudes required to apply genetic concepts. It involves applying Mendelian and chromosomal theories in theory in agricultural production. It also involves illustrating genetic mutations in agricultural 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 | 20 |
| 2. | Apply Mendelian theory | 30 |
| 3. | Apply Genetic mutation | 30 |
| **Total** | | **80** |

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

| Learning Outcome | Content | Suggested Assessment Methods |
|---|---|---|
| **1.** Apply Chromosomal theory | 1.1. Identification and illustration of chromosome structure<br>1.1.1. DNA<br>1.1.2. Proteins<br>1.1.3. Centromere<br>1.2. Identification and illustration of DNA structure | ● Written assessment<br>● Practical<br>● Projects<br>● Third party report<br>● Portfolio of evidence<br>● Oral questions |

| | | |
|---|---|---|
| | 1.3. Role of DNA<br>1.4. Cell division stages<br>1.4.1. Interphase<br>1.4.2. Prophase<br>1.4.3. Metaphase<br>1.4.4. Anaphase<br>1.4.5. Telophase | |
| **2.** Mendelian theory | 2.1. Variation in animal breeding<br>2.2. Monohybrid inheritance<br>2.3. Dihybrid inheritance<br>2.4. Complete dominance<br>2.5. Co-dominance<br>2.6. Incomplete dominance<br>2.7. phenotypes and genotypes illustrations<br>2.8. Identification and illustration of phenotypic frequencies | ● Written assessment<br>● Practical<br>● Projects<br>● Third party report<br>● Portfolio of evidence<br>● Oral questions |
| **3.** Apply Genetic mutation | 3.1. Causes of mutations<br>3.1.1. Radioactive rays<br>3.1.2. Chemicals<br>3.1.3. Infectious agents<br>3.2. Types of mutation<br>3.2.1. Chromosomal mutation<br>3.2.2. Gene mutation<br>3.3. Mutational disorders<br>3.3.1. Hypotrichosis<br>3.3.2. Beta-man<br>3.3.3. Osteoporosis<br>3.3.4. Pulmonary hypoplasia | ● Written assessment<br>● Practical<br>● Projects<br>● Third party report<br>● Portfolio of evidence<br>● Oral questions |

**Suggested methods of delivery**

- Demonstration
- Practical
- Discussion
- Direct instruction

**Recommended Resources for 25 Trainees**

| S/No. | Category/Item | Description/ Specifications | Quantity | Recommended Ratio (Item: Trainee) |
|---|---|---|---|---|
| **A** | **Learning Materials** | | | |
| 1. | Charts | Flip Charts Rules and Regulations | 5 | 1:5 |
| 2. | Markers | whiteboard markers and permanent markers | 50 | 1:1 |
| 3. | Video clips Audio tapes | MP4, MP3 | 5 | 1:5 |
| 4. | Newspapers and Handouts | Daily | 25 | 1:1 |
| 5. | Business Journals | Annual, Monthly, Daily | 25 | 1:1 |
| **B** | **Learning Facilities & Infrastructure** | | | |
| 6. | Lecture/Theory Room | (9* 8 sq. metres) | 1 | 1:25 |
| 7. | Internet Connection | WI-FI, Dial-Up, Cable, Fixed-wireless, | 1 | 1:25 |
| **C** | **Consumable Materials** | | | |
| 8. | Flashcards | Alphabet, Numbers, Math | 25 | 1:1 |

| | | | | |
|---|---|---|---|---|
| 9. | Stationery | Printing Papers, and Exercise Books Sizes A4, A3, A2 etc | 5 reams | 1:5 |
| **D** | **Tools And Equipment** | | | |
| 10. | Computers/Laptops | Any model | 1 | 1:25 |
| 11. | Projector | LED.LCD, Laser | 1 | 1:25 |
| 12. | Whiteboard | Glass, melamine, porcelain | 1 | 1:25 |