



**REPUBLIC OF KENYA**

**COMPETENCY BASED MODULAR CURRICULUM**

**FOR**

**ANALYTICAL CHEMISTRY TECHNOLOGY**

**KNQF LEVEL 6**

**(CYCLE 3) PROGRAMME ISCED CODE: 0531 554A**



**TVET CDACC**  
**P.O. BOX 15745-00100 NAIROBI**

## BIOCHEMICAL TECHNIQUES

**ISCED UNIT CODE: 0531 551 05A**

**TVET CDACC UNIT CODE: ASC/CU/ACHEM/CR/04/6/MA**

### **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: **Apply biochemical techniques.**

**Duration:** 180 Hours

### **Unit Description**

This unit specifies the competencies required to apply biochemical techniques. It involves performing biochemical tests, separation and qualitative analysis of bio-molecules, and preparation of buffer. It also involves performing biochemical analyses of biomolecules

### **Summary of Learning Outcomes**

<b>S/No</b>	<b>Learning Outcomes</b>	<b>Duration (Hours)</b>
1.	Perform biochemical tests	50
2.	Separate biomolecules	50
3.	Prepare buffer solutions	30
4.	Perform biochemical analyses of biomolecules	50
<b>Total</b>		<b>180</b>

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

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1 Perform biochemical tests	1.1 Collect biochemical samples 1.1.1 Lipids	<ul style="list-style-type: none"><li>• Practical Assessment</li></ul>

	<p>1.1.2 Proteins</p> <p>1.1.3 Carbohydrates</p> <p>1.1.4 Enzymes</p> <p>1.1.5 Vitamins</p> <p>1.2 Prepare reagents</p> <p>1.2.1 Buffer solutions</p> <p>1.2.2 Solvents</p> <p>1.3 Prepare biochemical samples</p> <p>1.4 Presence absence test</p> <p>1.4.1 Benedicts solution test</p> <p>1.4.2 Burette test</p> <p>1.4.3 Millon test</p> <p>1.4.4 Ninhydrin test</p>	<ul style="list-style-type: none"> <li>• Project-Based Assessment</li> <li>• Portfolio of Evidence</li> <li>• Written Assessment</li> </ul>
2 Separate biomolecules	<p>2.1 Collect biochemical samples</p> <p>2.2 Prepare biochemical reagents</p> <p>2.3 Isolate biomolecules</p> <p>2.4 Purify biomolecules</p>	<ul style="list-style-type: none"> <li>• Practical Assessment</li> <li>• Project-Based Assessment</li> <li>• Portfolio of Evidence</li> <li>• Written Assessment</li> </ul>
3 Prepare buffer solution	<p>3.1 select buffer components</p> <p>3.2 calculate buffer components</p> <p>3.3 prepare buffer stock solutions</p> <p>3.4 adjust pH of buffer solutions</p>	<ul style="list-style-type: none"> <li>• Practical Assessment</li> <li>• Project-Based Assessment</li> <li>• Portfolio of Evidence</li> <li>• Written Assessment</li> </ul>

	3.5 label buffer solutions 3.6 store buffer solutions	
4 Perform biochemical analyses of biomolecules	4.1 Collect biomolecules samples 4.2 Prepare biochemical reagents 4.3 Prepare biomolecules samples 4.4 Calibrate instruments 4.5 Documents results	<ul style="list-style-type: none"> <li>• Practical Assessment</li> <li>• Project-Based Assessment</li> <li>• Portfolio of Evidence</li> <li>• Written Assessment</li> </ul>

#### Suggested Methods of Delivery:

1. Direct instruction
2. Field trips/site visits
3. Group discussions
4. Demonstration by trainer
5. Practice by the trainee
6. Exercises

#### Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A</b>	<b>Learning Materials</b>			
1.	Power point presentations	For trainer's use	1	1:25
2.	Computer	For trainer's use	1	1:25
3.	White board markers/chalks	For trainer's use	1	1:25
4.	White/chalk board	For trainer's use	1	1:25
5.	Flip charts	For trainer's use	1	1:25
6.				
<b>B</b>	<b>Learning Facilities &amp; infrastructure</b>			

1.	Lecture room	For trainees use	1	1:25
2.	Fully equipped science laboratory	For trainees use	1	1:25
<b>C</b>	<b>Consumable materials</b>			
1.	Hands Gloves	For trainees use	25	1:1
2.	Face masks	For trainees use	25	1:1
3.	Food tests reagents	For trainees use	25	1:1
4.	Volumetric flasks	For trainees use	25	1:1
5.	Protein samples	For trainees use	25	1:1
6.	Carbohydrate samples	For trainees use	25	1:1
7.	Lipid sample	For trainees use	25	1:1
8.				
9.				
<b>D</b>	<b>Tools and Equipment</b>			
1.	Water baths	For trainees use	1	1:25
2.	Calorimeter	For trainees use	1	1:25
3.	Ovens	For trainees use	1	1:25
4.	Gel electrophoresis equipment	For trainees use	1	1:25
5.	Centrifuge	For trainees use	1	1:25
6.	Bunsen burner	For trainees use	1	1:25