



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

RESEARCH METHODS

ISCED UNIT CODE: 0542 551 16A

TVET CDACC UNIT CODE: ASC/OS/ACHEM/CC/06/6/MA

Relationship to Occupational Standards

This unit addresses the Unit of Competency: **Apply Research Methods**.

Duration: 150 Hours

Unit Description

This unit covers the competencies required in applying research methods. It involves developing research project proposal, carrying out sampling and data collection, applying methods of data analysis concepts, carrying out presentation and interpretation of data, and performs project report writing and presentation.

Summary of Learning Outcomes

S/No	Learning Outcomes	Duration (Hours)
1.	Develop research project proposal	30
2.	Carry out sampling and data collection	30
3.	Apply methods of data analysis	30
4.	Carry out presentation and interpretation of data	30
5.	Perform project writing and presentation	30
Total		150

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Develop research project proposal	1.1 Develop research design 1.1.1 Study survey 1.1.2 Experimental 1.1.3 Quantitative survey 1.1.4 Qualitative survey 1.2 Literature review 1.3 Develop research proposal	<ul style="list-style-type: none"> • Practical Assessment • Project-Based Assessment • Portfolio of Evidence • Written Assessment
2. Carry out sampling and data collection	2.1 Sampling plan 2.2 Sources of data 2.2.1 Primary sources 2.2.2 Secondary sources 2.3 Types of data	<ul style="list-style-type: none"> • Practical Assessment • Project-Based Assessment • Portfolio of Evidence • Written Assessment
3. Apply methods of data analysis concepts	3.1 Measures of central tendency 3.1.1 Mean 3.1.2 Mode 3.1.3 Median 3.2 Measures of dispersion 3.2.1 Standard deviation 3.2.2 Variance 3.3 Probability calculations 3.4 Correlation calculations	<ul style="list-style-type: none"> • Practical Assessment • Project-Based Assessment • Portfolio of Evidence • Written Assessment
4. Carry out presentation and interpretation of data	4.1 Data tabulation 4.2 Data classification 4.3 Statistical data presentation 4.3.1 Tabulation	<ul style="list-style-type: none"> • Practical Assessment • Project-Based Assessment • Portfolio of Evidence

	4.3.2 Graphical 4.3.3 Pie charts 4.4 Data interpretation	<ul style="list-style-type: none"> • Written Assessment
5. Perform project report writing and presentation	5.1 Findings documentation 5.2 Report conclusion 5.3 Recommendations 5.4 Project report presentation	<ul style="list-style-type: none"> • Practical Assessment • Project-Based Assessment • Portfolio of Evidence • Written Assessment

Suggested Methods of Instruction

- 1 Practical
- 2 Projects
- 3 Demonstrations
- 4 Group discussion
- 5 Direct instructions

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	Learning Materials			
1.	Power point presentations	For trainer's use	1	1:25
2.	Desktop computer/laptop	For trainer's use	1	1:25
3.	Projector	For trainer's use	1	1:25
4.	Standard manuals/SOPs	For trainer's use	1	1:25
5.	Flip charts	For trainer's use	1	1:25
6.	Whiteboard	For trainer's use	1	1:25
7.	Assorted reference materials	For trainer's and trainee use	5	5:25
B	Learning Facilities & infrastructure			
1.	Lecture/theory room	For trainer's and trainee use	1	1:25
2.	standard Science laboratory	For trainee use	1	1:25
3.	Internet connection	For trainee use	Enough	
4.	Assorted analytical instruments	For trainer's and trainee use	1	1:25

C	Consumable materials			
1.	Stationeries	For trainee use	25	1:1
2.	Gloves	For trainee use	25	1:1
3.	Masks	For trainee use	25	1:1
4.	Assorted whiteboard markers	For trainer's	enough	
5.	Assorted Glassware	For trainee use	enough	1:1
6.	Assorted equipment	For trainee use	enough	1:5
7.	Pestle and mortars	For trainee use	12	1:2
8.	aprons	For trainee use	25	1:1
9.	Specimen containers	For trainee use	25	1:1
10.	Assorted laboratory reagents	For trainee use	25	1:1
D	Tools and Equipment			
1.	Analytical balances	For trainee use	5	1:5
2.	First aid kit	For trainee use	25	1:25
3.	Muffle Furnace	For trainee use	1	1:25
4.	oven	For trainee use	2	1:12
5.	centrifuges	For trainee use	4	1:6
6.	refrigerator/freezer	For trainee use	1	1:25
7.	incubators	For trainee use	5	1:5
8.	Assorted samplers [ladles, buckets, stir bars]	For trainee use	1	1:25
9.	Laboratory mills	For trainee use	6	1:4
10.	Lab grinders	For trainee use	2	1:12
11.	Jaw crushers	For trainee use	2	1:12
12.	Laboratory digestion systems	For trainer and trainee use	1	1:25
13.	Moulds for sample preparation	For trainer and trainee use	5	1:5
14.	Assorted sieves	For trainer and trainee use	5	1:5
15.	Sample concentrators	For trainer and trainee use	5	1:5