SCIENTIFIC RESEARCH

ISCED UNIT CODE: 0588 551 15A

TVET CDACC UNIT CODE: APB/CU/AB/CC/05/6/MA

Relationship to Occupational Standards

This unit addresses the unit of competency: Conduct Scientific Research

Duration: 150 Hours

Unit Description

This unit specifies the competencies required to conduct science laboratory research. It involves preparing for science laboratory research, carrying out science laboratory research and analyzing the science laboratory research findings. It also includes documenting and disseminating science laboratory research findings.

Summary of Learning Outcomes

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

S/No	Learning Outcomes	Duration (Hours)
1.	Prepare for science laboratory research	50
2.	Apply scientific research methods	30
3.	Analyze science laboratory research findings	70
4	**TOTAL**	**150**

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare for science laboratory research	1.1 Introduction to research methods 1.2 Ethics in research 1.3 Research topics and study site 1.4 Research problem 1.5 Research objectives 1.6 Designing research questions 1.7 Development of conceptual framework 1.8 Establishment of research theoretical framework 1.9 Proposal writing procedures	• Practical Assessment • Project-Based Assessment • Portfolio of Evidence • Written Assessment
2. Carry out science laboratory research	2.1 Scientific study design 2.2 Sampling techniques 2.3 Sample size 2.4 Research instruments 2.5 Piloting of research instruments 2.6 Data collection	• Practical Assessment • Project-Based Assessment • Portfolio of Evidence • Third Party Reports • Written Assessment

3. Analyse science laboratory research findings	3.1 Standard Data Analysis Methods 3.2 Validity and Reliability of Analytical Methods 3.3 Research Ethical Considerations 3.4 Data Analysis Techniques 3.5 Data Presentation 3.6 Statistical Packages (e.g., SPSS, Excel) 3.7 Documentation of Research Processes 3.8 Recommendations of Research Study 3.9 Compiling Research Report 3.10 Dissemination of Research	• Practical Assessment • Project-Based Assessment • Portfolio of Evidence • Written Assessment

Suggested Delivery Methods

- Practical work
- Demonstration
- Demonstration videos
- Field trips / Excursion
- Trainee group discussions
- Case studies

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)	Computer	For trainer's use	1	1:25
3)	Standard manuals/SOPs	For trainer's use	1	1:25
4)	Flip charts	For trainer's use	1	1:25
5)	Stationeries	For trainee's use	25	1:1
B	Learning Facilities & infrastructure			
6)	Lecture/theory room	For trainer and trainee use	1	1:12
7)	Fully equipped science laboratory	For trainee's use	1	1:25
	Lecture room	For trainee's use	1	1:25
8)	Consumable materials			
9)	Disinfectant	For trainee's use	25	1:1
10)	Gloves	For trainee's use	25	1:1
11)	Laboratory coats	For trainee's use	25	1:1
12)	Face Masks	For trainee's use	25	1:1
D	Tools and Equipment			
13)	First aid kit	For trainee's use	1	1:25
14)	Goggles	For trainee's use	25	1:1
15)	Projector	For trainer's use	1	1:25
16)	Safety boots	For trainee's use	25	1:1