

## SCIENTIFIC RESEARCH

**UNIT CODE:** 0111 551 20 A

**TVET CDACC UNIT CODE:** AGR/CU/EXT/CR/02/6/MA

**UNIT DURATION:** 80 HOURS

### Relationship to Occupational Standards

This unit addresses the Unit of Competency: Conduct Scientific Research

### Unit Description

This unit specifies the competencies required to conduct Applied research. It involves preparing scientific research proposal, applying scientific research methods and analyzing scientific research finding.

### Summary of Learning Outcomes

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

S/No	Learning Outcomes	Duration (Hours)
1.	Prepare scientific research proposal	20
2.	Apply scientific research methods	40
3.	Analyze scientific research finding	20
Total		80

### Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcomes	Content	Suggested Assessment Methods
1. Prepare scientific	<b>Theory</b> 1.1 Scientific research proposal	<ul style="list-style-type: none"><li>• Written tests</li><li>• Third party</li></ul>

research proposal	<p>1.1.1 Definition of terms</p> <p>1.1.2 Types of research proposal</p> <p>1.1.2.1 Descriptive</p> <p>1.1.2.2 Quantitative</p> <p>1.1.2.3 Qualitative</p> <p>1.1.2.4 Case study</p> <p>1.2 Uses of research proposal</p> <p>1.3 Identification of research problems</p> <p>1.4 Developing objectives of research proposal</p> <p>1.5 Designing data collection method</p> <p>1.5.1 Questionnaires</p> <p>1.5.2 Interviews</p> <p>1.5.3 Experiment</p> <p>1.5.4 Survey</p> <p>1.5.5 Observation</p> <p>1.6 Structure of a research proposal</p> <p>1.6.1 Cover page</p> <p>1.6.2 Abstract</p> <p>1.6.3 Introduction</p> <p>1.6.4 Literature review</p> <p>1.6.5 Methodology</p> <p>1.6.6 Summary</p> <p>1.6.7 Conclusion</p> <p>1.6.8 Recommendation</p> <p><b>Practice</b></p> <p>1.7 Develop a research proposal and present.</p>	<p>report</p> <ul style="list-style-type: none"> <li>• Reflection papers</li> <li>• Projects</li> <li>• Interviews/ Oral questions</li> <li>• Workshop reports</li> <li>• Individual/group assignments</li> <li>• Case Studies</li> <li>• Practicals</li> </ul>
2. Scientific research methods	<p><b>Theory</b></p> <p>2.1 Research methods</p> <p>2.1.1 Definition of terms</p> <p>2.1.2 Types of research methods</p> <p>2.1.2.1 Questionnaires</p> <p>2.1.2.2 Interviews</p>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Third party report</li> <li>• Reflection papers</li> <li>• Projects</li> </ul>

	<p>2.1.2.3 Experiment</p> <p>2.1.2.4 Survey</p> <p>2.1.2.5 Observation</p> <p>2.2 Determine Sampling techniques</p> <p>2.2.1 Probability</p> <p>2.2.2 Non-probability</p> <p>2.3 Identification of research materials to be used.</p> <p>2.3.1 Encyclopedia</p> <p>2.3.2 Papers</p> <p>2.3.3 Books</p> <p>2.3.4 Articles</p> <p>2.3.5 Journals</p> <p>2.3.6 Website</p> <p><b>Practice</b></p> <p>2.4 Collect Data according to 2.1.2</p>	<ul style="list-style-type: none"> <li>• Interviews/ Oral questions</li> <li>• Workshop reports</li> <li>• Individual/group assignments</li> <li>• Case Studies</li> <li>• Practicals</li> </ul>
3. Analyse scientific research findings	<p><b>Theory</b></p> <p>1.1 Research findings</p> <p>1.1.1 Definition of terms</p> <p>1.1.2 Identify data analysis methods</p> <p>1.1.2.1 ANOVA</p> <p>1.1.2.2 Measure of central tendency</p> <p>1.1.2.3 Measure of dispersal</p> <p><b>Practice</b></p> <p>3.2 Prepare research report using the methods in 3.1.2.</p>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Third party report</li> <li>• Reflection papers</li> <li>• Projects</li> <li>• Interviews/ Oral questions</li> <li>• Workshop reports</li> <li>• Individual/group assignments</li> <li>• Case Studies</li> </ul>

		<ul style="list-style-type: none"> <li>• Practicals</li> </ul>
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### Suggested Methods of Instruction

- Role playing
- Group discussion
- Direct instruction

### Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A</b>	<b>Learning Materials</b>			
7.	Journals		5 pcs	1:5
8.	writing materials		50	2:1
9.	Charts		5	1:5
10.	PowerPoint presentations	For trainer's use		
11.	Whiteboard		1	1:25
12.	Assorted color of whiteboard markers	For trainers use		
13.	Printers		1	1:25
<b>B</b>	<b>Learning Facilities &amp; infrastructure</b>			
5.	Lecture/theory room		1	1:25
6.	Projector		1	1:25
7.	Assorted Flash Cards		25	
8.	Site		1	1:25
<b>C</b>	<b>Consumable materials</b>			
1.	Printing Papers	Ream	1	1:25
2.	Assorted color of whiteboard	For trainers use		

	marker			
<b>D</b>	<b>Tools and Equipment</b>			
1.	Paper questionnaire		25	1:1
2.	Paper checklist		25	1:1

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