

## SCIENCE LABORATORY PRACTICE

**UNIT CODE: 1022 441 02A**

**TVET CDACC UNIT CODE: SLT/OS/SL/CC/02/5/MA**

**UNIT DURATION:** 180 Hours

### **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Perform Science Laboratory Practice

### **Unit Description**

This unit specifies the competencies required to perform standard laboratory practices. It involves performing laboratory safety procedures, maintaining laboratory resources and preparing laboratory reagents and chemicals.

### **Summary of Learning Outcomes**

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

S/No	Learning Outcomes	Duration (Hours)
1.	Perform laboratory safety procedure	60
2.	Maintain laboratory resources	60
3.	Prepare laboratory reagents and chemicals	60
<b>Total</b>		<b>180</b>

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

Learning Outcome	Content	Suggested Assessment Methods
1. Perform laboratory safety procedure	1.1.Science laboratory PPEs 1.1.1 Lab coats 1.1.2 Gloves 1.1.3 Overalls 1.1.4 Goggles 1.1.5 Muffs 1.1.6 Face shields 1.1.7 Helmets	<ul style="list-style-type: none"><li>Practical</li><li>Project</li><li>Third party report</li><li>Portfolio of evidence</li><li>Written test</li><li>Oral test</li></ul>

	<p>1.1.8 Hair nets</p> <p>1.1.9 Respirators</p> <p>1.1.10 Masks</p> <p>1.2.Laboratory hazards and risks</p> <p>1.2.1 Chemical</p> <p>1.2.2 Biological</p> <p>1.2.3 Electrical</p> <p>1.2.4 Radioactive</p> <p>1.2.5 Musculoskeletal stresses</p> <p>1.2.6 Electrical</p> <p>1.2.7 Physical</p> <p>1.3.Handling and storage of laboratory chemicals and reagents</p> <p>1.3.1 Acids</p> <p>1.3.2 Bases</p> <p>1.3.3 Salts</p> <p>1.3.4 Indicators</p> <p>1.3.5 Distilled water</p> <p>1.4.Laboratory waste disposal</p> <p>1.4.1 Sharp objects</p> <p>1.4.2 Glassware</p> <p>1.4.3 Biological samples</p> <p>1.4.4 General lab waste</p> <p>1.4.5 Wipes</p> <p>1.4.6 Gloves</p> <p>1.4.7 Tissues</p> <p>1.4.8 Chemicals</p> <p>1.4.9 Radioactive materials</p> <p>1.4.10 Electrical materials</p> <p>1.5.Laboratory safety rules</p> <p>1.6.Risk assessment in the laboratory</p> <p>1.7.Types of laboratory related Injuries and their treatment</p> <p>1.8.First aid procedures.</p> <p>1.9.Development of emergency response procedures and preparedness.</p>	
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	1.10. Maintenance of records of hazards, risk assessment and control measures	
2. Maintain laboratory resources	<p>2.1 Laboratory inventory maintenance</p> <p>2.2 Maintain laboratory equipment and apparatus</p> <ul style="list-style-type: none"> <li>2.2.1 Calibration</li> <li>2.2.2 Cleaning</li> <li>2.2.3 Dusting</li> <li>2.2.4 Painting.</li> </ul> <p>2.3 Storage of laboratory resources</p> <p>2.4 Disposal of obsolete laboratory resources</p>	<ul style="list-style-type: none"> <li>• Practical</li> <li>• Project</li> <li>• Third party report</li> <li>• Portfolio of evidence</li> <li>• Written test</li> <li>• Oral test</li> </ul>
3. Prepare laboratory reagents and chemicals	<p>3.1 Assembly of laboratory equipment</p> <ul style="list-style-type: none"> <li>3.1.1 Bunsen burner</li> <li>3.1.2 Microscopes</li> <li>3.1.3 Hot plates</li> <li>3.1.4 Magnetic stirrer</li> <li>3.1.5 Water baths</li> <li>3.1.6 Oven</li> <li>3.1.7 Freezers</li> <li>3.1.8 Furnace</li> </ul> <p>3.2 Assembly of laboratory of laboratory apparatus</p> <ul style="list-style-type: none"> <li>3.2.1 Balances</li> <li>3.2.2 Wash bottles</li> <li>3.2.3 Glass ware</li> <li>3.2.4 Crucibles</li> <li>3.2.5 Brushes</li> <li>3.2.6 Filter papers</li> <li>3.2.7 Pestle and mortar</li> </ul> <p>3.3 Preparation of laboratory reagents and chemicals</p> <ul style="list-style-type: none"> <li>3.3.1 Acids</li> <li>3.3.2 Bases</li> <li>3.3.3 Salts</li> <li>3.3.4 Indicators</li> <li>3.3.5 Distilled water</li> </ul> <p>3.4 Storage of laboratory reagents and chemicals</p>	<ul style="list-style-type: none"> <li>• Practical</li> <li>• Project</li> <li>• Third party report</li> <li>• Portfolio of evidence</li> <li>• Written test</li> <li>• Oral test</li> </ul>

## **Suggested Methods of Instruction**

- Demonstration
- Viewing of related videos
- Discussion
- Direct Instruction

## **Recommended Resources for 25 Trainees**

<b>S/No.</b>	<b>Category/Item</b>	<b>Description/ Specifications</b>	<b>Quantity</b>	<b>Recommended Ratio (Item: Trainee)</b>
<b>A</b>	<b>Learning Materials</b>			
1.	Computer	For trainer's use	1	1:25
2.	Projector	For trainer's use	1	1:25
3.	Standard manuals/SOPs	For trainer's use	<b>1</b>	1:25
4.	Flip charts	For trainer's use	<b>1</b>	1:25
5.	White /black board	For trainer's use	<b>1</b>	1:25
<b>B</b>	<b>Learning Facilities &amp; infrastructure</b>			
	Lecture room	For trainee use	1	1:25
	Standard science laboratory	For trainee use	1	1:25
	Lecture room	For trainee use	<b>1</b>	1:25
<b>C</b>	<b>Consumable materials</b>			
1.	Stationeries	For trainee use	<b>25</b>	1:1
2.	Gloves	For trainee use	<b>25</b>	1:1
3.	Laboratory coats	For trainee use	<b>25</b>	1:1
4.	Goggles	For trainee use	<b>25</b>	1:1
5.	Face masks	For trainee use	<b>25</b>	1:1
<b>D</b>	<b>Apparatus and Equipment</b>			
1.	Compound light microscope	For trainee use	<b>5</b>	1:5
2.	Safety boot	For trainee use	<b>25 pairs</b>	1:1

<b>3.</b>	Laboratory coats	For trainee use	<b>25</b>	1:1
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