

## LABORATORY PRACTICE PRINCIPLES

**ISCED UNIT CODE: 0511 551 02A**

**TVET CDACC UNIT CODE: APB/CU/AB/CC/06/6/MA**

### **Relationship to Occupational Standards**

This unit addresses the unit of competency: Apply standard laboratory practices

**Duration:** 130 hours

### **Unit Description**

This unit of competency provides competencies required by a applied biology technologist to apply laboratory and management practices. The practices include maintaining laboratory safety, preparing laboratory water, managing laboratory personnel and material resources, and managing laboratory waste.

### **Summary of Learning Outcomes**

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

<b>S/No</b>	<b>Learning Outcomes</b>	<b>Duration (Hours)</b>
1.	Maintain laboratory safety	40
2.	Prepare laboratory water	30
3.	Manage laboratory personnel and material resource	30
4.	Manage laboratory waste	30
	<b>TOTAL</b>	<b>130</b>

## Learning Outcomes, Content and suggested methods of assessment

Learning Outcome	Content	Suggested methods of assessment
1. Maintain laboratory safety	1.1 Sources of hazards and risks 1.2 Identification of laboratory hazards and risks 1.2.1 Chemical 1.2.2 Biological 1.2.3 Physical 1.2.4 Electrical 1.2.5 Fire 1.2.6 Radiation 1.3 Laboratory safety procedures 1.4 Good house keeping 1.5 PPEs 1.6 Storage of laboratory samples 1.7 Safe handling and storage of laboratory reagents and chemicals 1.8 Types of injuries and their treatment 1.8.1 Cuts 1.8.2 Bleeding 1.8.3 Bites 1.8.4 Burns and scalds 1.8.5 Bruises 1.8.6 Fractures 1.8.7 Wounds 1.9 First aid procedures	<ul style="list-style-type: none"> <li>• Practical assessment</li> <li>• Portfolio of evidence</li> <li>• Oral assessment</li> <li>• Third party report</li> <li>• Written tests</li> </ul>

<p>2. Prepare laboratory water</p>	<p>2.1 Sources of water</p> <p>2.2 Methods of water treatment</p> <p>2.2.1 Distillation</p> <p>2.2.2 Deionization</p> <p>2.2.3 Filtration</p> <p>2.2.4 Sedimentation</p> <p>2.2.5 Reverse osmosis</p> <p>2.2.6 Adsorption</p>	<ul style="list-style-type: none"> <li>• Practical assessment</li> <li>• Portfolio of evidence</li> <li>• Oral assessment</li> <li>• Third party report</li> <li>• Written tests</li> </ul>
<p>3. Manage laboratory personnel and material resource</p>	<p>3.1 Definition of management</p> <p>3.2 Functions of management</p> <p>3.3 Management schools of thought</p> <p>3.4 Modern theories of management</p> <p>3.5 Maintain laboratory equipment</p> <p>3.5.1 Calibration</p> <p>3.5.2 Validation</p> <p>3.5.3 Preventive maintenance</p>	<ul style="list-style-type: none"> <li>• Practical assessment</li> <li>• Portfolio of evidence</li> <li>• Oral assessment</li> <li>• Third party report</li> <li>• Written tests</li> </ul>
<p>4. Manage laboratory waste</p>	<p>4.1 Types of laboratory wastes</p> <p>4.1.1 Infectious waste</p> <p>4.1.2 General waste</p> <p>4.1.3 Poisonous waste</p> <p>4.1.4 Chemical waste</p> <p>4.2 Segregation and disposal of laboratory waste</p> <p>4.2.1 Organic wastes</p> <p>4.2.2 Inorganic waste</p> <p>4.3 Methods of waste disposal</p> <p>4.4 Decontamination and cleaning of laboratory working areas, benches and equipment.</p>	<ul style="list-style-type: none"> <li>• Practical assessment</li> <li>• Portfolio of evidence</li> <li>• Oral assessment</li> <li>• Third party report</li> <li>• Written tests</li> </ul>

### Suggested Methods of instruction

- Practical sessions
- Group discussions
- Demonstration by trainer
- Exercises by trainee

### 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)	Lab manuals	Trainees	25	1:1
<b>B</b>	<b>Learning Facilities &amp; infrastructure</b>			
3)	Lecture/theory room	Trainer and Trainees	1	1:25
4)	Fully equipped laboratory	Trainer and Trainees	1	1:25
5)	Computers with internet connection	Trainees	5	1:5
6)	Projectors	Trainers	1	1:25
7)	Microscopes	Trainees	5	1:5
<b>C</b>	<b>Consumable materials</b>			
8)	Gloves	Trainees	25 pairs	1:1
9)	Disposable Masks	Trainees	25	1:1
<b>D</b>	<b>Tools and Equipment</b>			
10)	Goggles	Trainees	25	1:1
11)	Lab coats	Trainees	25	1:1