INORGANIC AND ORGANIC CHEMISTRY

ISCED UNIT CODE: 0531 441 05A

TVETCDACC UNIT CODE: ENV/CU/ENT/CC/01/5/MA

UNIT DURATION: 120 HOURS

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Apply inorganic and organic chemistry

Unit Description

This unit specifies the competencies required to apply inorganic and organic chemistry. It involves applying physical chemistry principles, inorganic and organic chemistry concepts.

Summary of Learning Outcomes

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

S/No	Learning Outcomes	Duration (Hours)
1.	Apply physical chemistry principles	40
2.	Apply inorganic chemistry concepts	40
3.	Apply organic chemistry concepts	40
Total		**120**

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcomes	Content	Suggested Assessment Methods
1. Apply physical chemistry principles	**Theory** 1.1 Acid and bases 1.1.1 Definition of terms 1.1.1.1 Acids 1.1.1.2 Bases 1.1.1.3 Salts 1.1.2 Characteristics of acid and bases 1.1.3 classification of acids and bases	• Practical • Written tests • Projects • Interviews/ Oral questions • Individual/group assignments

	1.1.3.1 Strong acids and bases 1.1.3.2 Weak acids and bases 1.1.4 Uses of acids and bases 1.1.5 Preparation of acids and bases 1.2 Salts 1.2.1 Characteristics of Salts 1.2.2 classification of Salts 1.2.3 Uses of Salts 1.2.4 Preparation of Salts 1.3 Application of ionic and chemical equilibrium properties 1.4 Application of Gases properties **Practice** 1.5 Prepare acids and bases 1.6 Prepare Salts	• Third party report
2. Apply inorganic chemistry concepts	**Theory** 2.1 Periodic table 2.1.1 Definition of terms 2.1.1.1 Periodic Table 2.1.1.2 An element 2.1.1.3 An atom 2.1.2 Elements of periodic table 2.1.3 Atomic numbers 2.1.4 Chemical bonds 2.1.4.1 Ionic bonds 2.1.4.2 Covalent bonds 2.1.4.3 Metallic bonds 2.1.4.4 Hydrogen bonds	• Practical • Written tests • Projects • Interviews/ Oral questions • Individual/group assignments • Third party report
3. Apply organic chemistry concepts	**Theory** 3.1 Organic compounds 3.1.1 Definition of a compound 3.1.2 Classes of organic compounds 3.1.2.1 Carbohydrates	• Practical • Written tests • Projects • Interviews/ Oral questions

	3.1.2.2 Proteins 3.1.2.3 Lipids 3.1.2.4 Hydrocarbons 3.2 Physical properties 3.2.1 Color 3.2.2 Hardness 3.2.3 Mass 3.2.4 Solubility 3.3 Chemical properties 3.3.1 Ph 3.3.2 Chemical stability 3.3.3 Radioactivity 3.3.4 Flammability 3.3.5 Heat of combustion 3.4 Purification of synthesized compounds 3.4.1 Uses of purified compounds **Practice** 3.5 Carry out purification of ssynthesized compounds	• Individual/group assignments • Third party report

Suggested Methods of Instruction

- Demonstration
- Role playing
- Group discussion
- Direct instruction
- Question & Answer

Recommended Resources for 25 trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	**Learning Materials**			

1.)	Nitric acid (HNO_3)		25 lit	1:1
2.)	Sulfuric acid (H_2SO_4)		25 lit	1.1
3.)	Calcium hydroxide ($Ca(OH)_2$)			
4.)	Sodium hydroxide (NaOH)		25 lit	1.1
5.)	Phosphoric acid (H_3PO_4)		25 lit	1.1
B	**Learning Facilities & infrastructure**			
1.)	Lecture/theory room		1	1:25
2.)	Laboratory		1	1:25
C	**Tools and Equipment**			
1.)	Beakers		25 pcs	1:1
2.)	Funnels		25 pcs	1:1
3.)	Magnetic stirrers		25 pcs	1:1
4.)	Flasks		5 pcs	1:5
5.)	Test tubes and racks		25 pcs	1:1
6.)	Pipettes		25 pcs	1:1
7.)	Thermometers		25 pcs	1:1
8.)	pH meters or pH strips		25 pcs	1:1