INORGANIC AND ORGANIC CHEMISTRY

ISCED UNIT CODE: 0531 551 21A

TVET CDACC UNIT CODE: HO/CU/HP/CC/03/6/MA

Unit duration: 80 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

SNO	Learning Outcome	Duration (Hours)
1.	Apply physical chemistry principles	20
2.	Apply inorganic chemistry concepts	30
3.	Apply organic chemistry concepts	30
	TOTAL	**80**

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 1.1.3.1 Strong acids and bases	• Practicals • Written tests • Projects • Interviews/ Oral questions • Individual/group assignments • Third party report

	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	
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	• Practicals • 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	• Practicals • 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

Tools and equipment's

- Beakers

- Flasks
- Test tubes and racks
- Pipettes
- Burettes
- Funnels
- Stirring rods
- Thermometers
- pH meters or pH strips
- Balances
- Graduated cylinders
- Hot plates or Bunsen burners
- Tongs and forceps
- Magnetic stirrers
- Fume hoods

Materials

- Sulfuric acid (H_2SO_4)
- Hydrochloric acid (HCl)
- Nitric acid (HNO_3)
- Acetic acid (CH_3COOH)
- Phosphoric acid (H_3PO_4)
- Sodium hydroxide (NaOH)
- Potassium hydroxide (KOH)
- Ammonium hydroxide (NH_4OH)
- Calcium hydroxide ($Ca(OH)_2$)

- Sodium chloride (NaCl)
- Copper sulfate ($CuSO_4$)
- Magnesium sulfate ($MgSO_4$)
- Ammonium nitrate (NH_4NO_3)
- Sodium carbonate (Na_2CO_3)

- Organic solvents (e.g., ethanol, acetone, hexane)

- Catalysts (e.g., palladium, platinum, zeolites)
- Reagents (e.g., Grignard reagents, alkyl halides)
- Oxidizing agents (e.g., potassium permanganate, hydrogen peroxide)
- Reducing agents (e.g., lithium aluminum hydride, sodium borohydride)
- Distilled water