

MONASH UNIVERSITY FOUNDATION YEAR

Subject guide for studies in
Semester 1, 2024

MUF0041 Chemistry Unit 1: Chemistry and the Natural World

Overview

Unit 1 Chemistry examines the structure and properties of matter. It is concerned with the behavior and interaction of chemical substances and the changes that occur during chemical reactions. Unit 1 Chemistry provides insights into natural phenomena at the molecular level, a framework of knowledge for the development of new materials and the means for the attainment of a sustainable environment for the future.

Prerequisites

Before undertaking Chemistry Unit 1, it is recommended students have completed an appropriate Year 11 Chemistry or equivalent program. This includes a Year 11 knowledge of: Acids and bases, atomic structure, atomic number and mass number, calculation of relative atomic mass, combined gas equation, elements, compounds, mixtures, empirical and molecular formulas, gas behavior and gas laws, intermolecular forces, isotopes, metallic, ionic and covalent bonding, mole calculations, percentage composition, pH, polarity, polymers and polymerisation, properties of water related to structure and bonding, redox reactions, solubility and precipitation, stoichiometry and systematic naming of simple organic compounds.

Knowledge outcomes

At the end of this unit students will be able to:

- Demonstrate an understanding of the language of Chemistry
- Complete calculations relating to the mole, solutions, gases and stoichiometry
- Demonstrate an understanding of atomic structure, the trends in the Periodic Table and bonding
- Relate bonding to the properties of substances
- Demonstrate an understanding of thermochemistry, rates and equilibrium concepts of reactions
- Demonstrate an understanding of acids and bases, including theories, pH calculations and buffers

Skills and behaviours outcomes

At the end of this unit students will be able to:

- Work independently or as a team to achieve outcomes
- Present data or other scientific information using an appropriate format
- Apply chemical and general scientific knowledge to identify, analyse and solve problems using appropriate chemical models, equations and calculations
- Collect, record and analyse data and evaluate experimental design
- Research, interpret and communicate information accurately relevant to a scientific concept
- Recognise the importance of green chemistry and safety in the laboratory and comply with safety procedures

Assessment	
Assessment Task	Weighting
Skills and Application Task	20%
Practical Assessment 1	20%
Practical Assessment 2	20%
Participation	10%
Examination	30%

MUF0042 Chemistry Unit 2: Chemistry and the Changing World

Overview

Unit 2 explores the area of Organic Chemistry and Energy and the impact of these on society and us. The development of new medicines and understanding their interaction with biological macromolecules along with the development of new sustainable polymers and energy sources are all very important areas of chemistry in a changing world. Unit 2 builds on the fundamental knowledge developed in Unit 1 to understand the world around us.

Prerequisites

MUF0042 Chemistry Unit 2: Chemistry and the Changing World can only be undertaken by students who have successfully completed MUF0041 Chemistry Unit 1: Chemistry and the Natural World.

Knowledge outcomes

At the end of this unit students will be able to:

- Demonstrate an understanding of the language of Chemistry
- Describe the structure, bonding and reactions of a range of organic compounds including polymers and biological macromolecules
- Demonstrate an understanding of techniques used to isolate and quantify organic compounds
- Demonstrate an understanding of the techniques used to determine the structure of an organic compound
- Demonstrate an understanding of the energy changes in chemical reactions and how this can be quantified.
- Demonstrate an understanding of the interconversion of chemical energy to electrical energy in electrochemical cells.

Skills and behaviours outcomes

At the end of this unit students will be able to:

- Work independently or as a team to achieve outcomes
- Present data or other scientific information using an appropriate format
- Apply chemical and general scientific knowledge to identify, analyse and solve problems using appropriate chemical models, equations and calculations
- Collect, record and analyse data and evaluate experimental design
- Research, interpret and communicate information accurately relevant to a scientific concept
- Recognise the importance of Green Chemistry and safety in the laboratory and comply with safety procedures

Assessment	
Assessment Task	Weighting
Skills and Application Task	20%
Practical Assessment	20%
Research Project	20%
Participation	10%
Examination	30%