

# Chemistry

## Units 1-2

The chemistry undertaken in this study provides students with the skills to pursue further studies and is representative of the major ideas of Chemistry. Students become responsible decision-making citizens able to use chemical knowledge in their everyday lives. Students are led to evaluate and debate important issues such as the future of our environment and its management.

**Students need to have studied Units 1 and 2 Chemistry before attempting Units 3 and 4 Chemistry.**

### UNIT 1

Students will consider: 'How can the diversity of materials be explained?'

This will be achieved by studying atomic theory, bonding in matter, the periodic table, organic chemistry and the nature, properties and uses of many materials. Current theory and latest research will be investigated against a backdrop of the historical development of chemistry dating back to the Greek philosophers. This unit is designed for students who are intending to undertake future studies of Chemistry or who are interested in the structures and properties of materials - how is the world put together?

### LEARNING ACTIVITIES

Laboratory investigations are a major focus.

### KEY SKILLS REQUIRED

Equation writing and numerical calculations require well-developed numeracy and literacy skills.

### ASSESSED TASKS

Research, experimental work, topic tests, review questions, independent investigation report and an end of semester examination.

### UNIT 2

Students will consider: 'What makes water such a unique chemical?' Its remarkable properties allow life to exist on Earth.

Students will study how different substances interact with water, and how substances in water are measured and analysed. This will be achieved by studying the properties of water, water as a solvent, acid and base reactions, and redox reactions.

### LEARNING ACTIVITIES

Laboratory work, research, online investigations.

### KEY SKILLS REQUIRED

Prospective students should possess well-developed numeracy and literacy skills. Stoichiometry provides a numerical means of quantifying the many chemical processes studied.

### ASSESSED TASKS

Research, experimental work, topic tests, review questions, independent investigation report and an end of semester examination.

# Chemistry

## Units 3-4

This subject will provide students with the skills to pursue further studies. All students should become more informed, responsible decision-making citizens able to use chemical knowledge in their everyday lives and to evaluate and debate important issues such as the future of our environment and its management.

**Students need to have satisfactorily completed Units 1 and 2 Chemistry prior to studying Units 3 and 4.**

### UNIT 3

Students compare and evaluate different chemical energy resources, including fossil fuels, biofuels, galvanic cells and fuel cells. They investigate the combustion of fuels, including the energy transformations involved, the use of stoichiometry to calculate the amounts of reactants and products involved in the reactions, and calculations of the amounts of energy released and their representations. Students consider the purpose, design and operating principles of galvanic cells, fuel cells and electrolytic cells. In this context they use the electrochemical series to predict and write half and overall redox equations, and apply Faraday's laws to calculate quantities in electrolytic reactions.

#### LEARNING ACTIVITIES

Practical activities and reports, research, text reading and responding and undertaking experiments.

#### KEY SKILLS REQUIRED

An ability to inquire scientifically, apply and communicate chemical understandings and information and an ability to complete basic numerical calculations.

#### ASSESSED TASKS

Two different types of assessment chosen from a range of options including a report, media analysis and a reflective learning journal.

### UNIT 4

Students study the ways in which organic structures are represented and named. They process data from instrumental analyses of organic compounds to confirm or deduce organic structures, and perform volumetric analyses to determine the concentrations of organic chemicals in mixtures. Students consider the nature of the reactions involved to predict the products of reaction pathways and to design pathways to produce particular compounds from given starting materials.

#### LEARNING ACTIVITIES

Practical activities and reports, research, text reading and answering text questions and the completion of worksheets.

#### KEY SKILLS REQUIRED

An ability to inquire scientifically, apply and communicate chemical understandings and information and an ability to complete numerical calculations.

#### ASSESSED TASKS

Two different types of assessment chosen from a range of options including a report, media analysis and a reflective learning journal as well as a structured scientific poster according to the VCAA standard template.

#### VCAA ASSESSMENT – The overall Study Score will consist of:

School Assessed Coursework 40% (Unit 3: 16% & Unit 4: 24%), end of year written examination 60%.