

# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** CHEMISTRY 1

**Unit ID:** SCCHM1001

**Credit Points:** 15.00

**Prerequisite(s):** Nil

**Co-requisite(s):** Nil

**Exclusion(s):** Nil

**ASCED:** 010599

**Description of the Unit:**

The contents of this unit focus on introductory level general and physical chemistry principles. On completion of SCCHM1001, students will have gained an understanding of atomic structure, how atoms and molecules interact with each other and how this affects their bonding, reactivity, 3D structure and physical properties. Understanding stoichiometry as well as intermolecular forces will be a focus of this unit. A number of important topics such as thermodynamics, kinetics and equilibria, will be covered which will help to prepare students for a deeper exploration of chemistry in further units. The concepts developed within lectures, workshops and tutorials are complemented through an integrated laboratory program where students will develop skills in laboratory techniques, scientific inquiry, and scientific communication.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

**Work Experience:**

No work experience: Student is not undertaking work experience in industry.

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

**Course Level:**

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Learning Outcomes:

#### Knowledge:

- K1.** Classify the states of matter and represent chemical and physical changes involved in transformations.
- K2.** Discuss the features of atomic structure and the construction of the periodic table of elements.
- K3.** Interpret relationships between electronic structure and bonding and recognise factors which give rise to polarity and its relationship to intermolecular bonding.
- K4.** Describe the composition of a chemical compound and be able to use the mole concept to solve quantitative problems in chemical reactions.
- K5.** Use models of chemical structures to explain the behaviour and properties of compounds.
- K6.** Explain the energy involved in chemical reactions and changes of state and use thermodynamics to be able to predict the direction of spontaneous change.
- K7.** Explain reaction kinetics at the macroscopic and microscopic level.
- K8.** Explain how equilibrium systems respond to change and solve quantitative problems involving equilibria.

#### Skills:

- S1.** Identify and interrelate chemistry at symbolic, observational and molecular levels.
- S2.** Demonstrate ability to conduct laboratory experiments safely and ethically
- S3.** Communicate experimental outcomes in an appropriate form, including written reports or presentations
- S4.** Write and balance chemical equations and use these to perform appropriate calculations.

#### Application of knowledge and skills:

- A1.** Apply theoretical knowledge to solve problems and conduct laboratory exercises and communicate their finding in a variety of ways including laboratory reports and presentations.
- A2.** Apply appropriate problem-solving techniques to solve problems both independently and within teams.
- A3.** Incorporate data collection and inference of its meaning to written reports.

#### Unit Content:

The curriculum focuses on general chemistry principles as well as an introduction to physical chemistry topics of thermodynamics, kinetics and equilibria which will prepare students for both further study in chemistry as well as other scientific disciplines. On completion of SCCHM1001, students will have gained an understanding of:

Topics may include:

- Atomic structure, how atoms and molecules interact with each other and how this affects their bonding, reactivity, 3D structure and physical properties.
- Stoichiometry.
- Intermolecular forces.
- Thermodynamics, kinetics and equilibria.

## FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	<p>Students will demonstrate the ability to effectively communicate, inter-act and work with others both individually and in groups. Students will be required to display skills in-person and/or online in:</p> <ul style="list-style-type: none"> <li>Using effective verbal and non-verbal communication</li> <li>Listening for meaning and influencing via active listening</li> <li>Showing empathy for others</li> <li>Negotiating and demonstrating conflict resolution skills</li> <li>Working respectfully in cross-cultural and diverse teams.</li> </ul>	S2, S3, A2	AT2
FEDTASK 2 Leadership	<p>Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in:</p> <ul style="list-style-type: none"> <li>Creating a collegial environment</li> <li>Showing self-awareness and the ability to self-reflect</li> <li>Inspiring and convincing others</li> <li>Making informed decisions</li> <li>Displaying initiative</li> </ul>	S2, S3, A2	AT2
FEDTASK 3 Critical Thinking and Creativity	<p>Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in:</p> <ul style="list-style-type: none"> <li>Reflecting critically</li> <li>Evaluating ideas, concepts and information</li> <li>Considering alternative perspectives to refine ideas</li> <li>Challenging conventional thinking to clarify concepts</li> <li>Forming creative solutions in problem solving.</li> </ul>	S1, S3, A1, A3	AT1, AT2, AT3

<b>FEDTASK attribute and descriptor</b>		<b>Development and acquisition of FEDTASKS in the Unit</b>	
		<b>Learning Outcomes (KSA)</b>	<b>Assessment task (AT#)</b>
FEDTASK 4 Digital Literacy	<p>Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in:</p> <ul style="list-style-type: none"> <li>• Finding, evaluating, managing, curating, organising and sharing digital information</li> <li>• Collating, managing, accessing and using digital data securely</li> <li>• Receiving and responding to messages in a range of digital media</li> <li>• Contributing actively to digital teams and working groups</li> <li>• Participating in and benefiting from digital learning opportunities.</li> </ul>	S3, A3	AT1, AT2, AT3
FEDTASK 5 Sustainable and Ethical Mindset	<p>Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in:</p> <ul style="list-style-type: none"> <li>• Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts</li> <li>• Committing to social responsibility as a professional and a citizen</li> <li>• Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses</li> <li>• Embracing lifelong, life-wide and life-deep learning to be open to diverse others</li> <li>• Implementing required actions to foster sustainability in their professional and personal life.</li> </ul>	S2, S3, A2	AT2

### Learning Task and Assessment:

<b>Learning Outcomes Assessed</b>	<b>Assessment Tasks</b>	<b>Assessment Type</b>	<b>Weighting</b>
K1-K8, S1, S4	Students will demonstrate their understanding of the main concepts presented in the unit and apply those concepts to problems and examples	Final Examination/Test	50-60%
K1-K8, S1-S4, A1-A3	Students will demonstrate their practical laboratory skills and ability to communicate results	Laboratory work and reports / presentations.	20-30%
K1-K8, S1, S4, A1, A2	Students will demonstrate their ability to apply chemical concepts to simple problems	On-line quizzes and activities.	20-30%

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
S2	Attendance and participation in laboratory sessions to complete assessments of practical skills	$\geq 80\%$ engagement (and where required attendance) with laboratory sessions	Satisfactory/Unsatisfactory

**Adopted Reference Style:**

Australian Harvard

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)