

UNIT CODE	UPRCHE401
UNIT TITLE	Investigate chemical science problems
APPLICATION	<p>This unit describes the performance outcomes, skills and knowledge required to investigate and formulate solutions to chemical science problems at university entrance level.</p> <p>It requires the ability to apply chemical theory and methodology, as a means of solving a variety of chemical science problems at university entrance level.</p> <p>The unit applies to individuals who are seeking to develop their knowledge and skills in chemical science, to facilitate an entry pathway into higher/tertiary vocational education courses, at undergraduate degree or Diploma/Advanced Diploma level.</p> <p><i>No occupational licensing, certification or specific legislative requirements apply to this unit at the time of publication.</i></p>
PRE-REQUISITE UNIT <i>OPTIONAL FIELD</i>	Nil
ELEMENTS	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes of the unit</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Apply knowledge of chemical facts and principles to solve problems	<p>1.1 Identify and summarise chemical facts, formulae, procedures, theories/principles, and/or terminology where required</p> <p>1.2 Solve chemical science problems by selecting and using facts, formulae, procedures, theories/principles</p> <p>1.3 Draw, label and interpret chemical tables, graphs, diagrams and / or sequences</p>

2. Analyse, evaluate and present information on chemical science topics	<p>2.1 Collect data/information on matters of chemical science and assess for relevance and accuracy</p> <p>2.2 Analyse and evaluate data/information on chemical science matters, obtained from a range of sources</p> <p>2.3 Present written information on chemical science, conforming to an accepted academic format</p>
3. Solve problems in chemical science using complex reasoning	<p>3.1 Use relevant chemical science evidence from at least two areas to reach a conclusion</p> <p>3.2 Employ complex reasoning processes as relevant, to support chemical science problem solving</p> <p>3.3 Integrate and evaluate relevant learned information to solve a novel problem in chemical science</p> <p>3.4 Participate actively in group discussion on how chemical science concepts relate to data, and/or observations as part of the problem-solving</p> <p>3.5 Use technology, in compliance with health and safety practices, to assist with data collection and problem solving</p>
4. Deliver a presentation on a chemical science topic and contribute to group discussion	<p>4.1 Deliver a presentation to a peer group on a chemical science topic using appropriate visual/other aids</p> <p>4.2 Present relevant information/ideas in a coherent, logical manner</p> <p>4.3 Contribute to other presentations through listening, questioning and/or discussion, as required</p> <p>4.4 Use chemical science terminology correctly, in context</p> <p>4.5 Speak clearly and accurately in accepted form and style for presenting chemical science information/ideas</p>
5. Evaluate the strengths and limitations of scientific work in relation to chemical science	<p>5.1 Collate and analyse information on a contemporary application of scientific work undertaken in chemical science</p> <p>5.2 Compare differing perspectives on an application of chemical science work in present day society</p> <p>5.3 Describe the scientific method in relation to chemical science and identify situations in which it is, or is not, effective</p> <p>5.4 Identify and discuss ethical issues in relation to research/work undertaken in chemical science</p>

6. Operate safely and proficiently in chemical science activities	<p>6.1 Clarify as required and follow the organisation's written laboratory and/or field study procedures carefully and accurately</p> <p>6.2 Use laboratory apparatus in accordance with the organisation's procedures and manufacturers' instructions</p> <p>6.3 Work with chemicals, materials and equipment safely in accordance with legislative obligations/safety data sheets, organisational procedures and manufacturers' instructions, as and where required</p>
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FOUNDATION SKILLS

Foundation skills essential to performance in this unit, but not explicit in the performance criteria are listed below, along with a brief context statement.

Skill <u>Remove</u> skills that do not apply to unit.	Performance Criteria	Description
Reading skills to:	1.1 – 1.3; 2.1 - 2.3; 5.1; 6.1 - 6.3	Research; interpret theory and information specific to chemical science/academic purpose
Writing skills to:	1.1; 2.3; 5.1; 5.2	Summarise data/information; compile notes; write and construct documents in clear, logical terms in accordance with specific scientific/academic purpose
Oral communication skills to:	3.4; 4.1–4.5	Participate actively in discussion; deliver a structured presentation to peer group Convey information logically and coherently; use terminology in context; clear pronunciation
Numeracy skills to:	1.1 – 1.3; 3.2; 3.3; 3.5; 6.3	Analyse/interpret graphical, statistical and other mathematical information as relevant to specific chemical science purpose Apply mathematical calculations to assist in investigation of chemical science problems
Learning skills to:	2.1; 2.2; 3.2; 3.3; 4.1; 4.4	Use known strategies and approaches; adapt to own learning style to achieve required discipline outputs
Problem-solving skills to:	1.2; 2.1; 2.2; 3.1 - 3.4; 5.3	Collate, organise, analyse facts, theories, principles, other relevant information Apply logical/complex reasoning processes to assist in solving chemical science problems individually or with others
Initiative and enterprise skills to:	2.1; 2.2; 3.3; 5.1 - 5.4	Draw upon known/learned information to evaluate and solve a novel problem

		Obtain data/information from sources other than given learning materials, to support chemical science analysis							
Teamwork skills to:	2.1; 3.4; 4.3	Participate actively in discussions and in practical field/ laboratory work/ activities with peer group							
Planning and organising skills to:	2.1 -2.3; 3.3; 4.1; 5.1	Collate and process gathered data/information; plan, organise approaches to solve specific chemical science matters Sequence, prioritise own learning and workload to achieve outcomes							
Self-management skills to:	2.1 -2.3; 3.4; 3.5; 6.1 – 6.3	Self-direct learning/study, preparation and production of required discipline-specific outputs in the academic environment Undertake activities in accordance with safety requirements and guidelines							
Technology skills to:	2.1 – 2.3; 3.5; 4.1; 5.1 -5.4; 6.2; 6.3	Use and apply appropriate technology/tools to support investigation, purpose and presentation of chemical science matters							
UNIT MAPPING INFORMATION	<table border="1"> <thead> <tr> <th>Code and Title Current Version</th> <th>Code and Title Previous Version</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>UPRCHE401 Investigate chemical science problems</td> <td>QLD204CHE01A Investigate chemical science problems</td> <td>Equivalent Unit</td> </tr> </tbody> </table>			Code and Title Current Version	Code and Title Previous Version	Comments	UPRCHE401 Investigate chemical science problems	QLD204CHE01A Investigate chemical science problems	Equivalent Unit
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TITLE	Assessment Requirements for: UPRMICHE401 Investigate chemical science problems
PERFORMANCE EVIDENCE	<p><i>The learner must show evidence of the ability to:</i></p> <ul style="list-style-type: none"> - <i>complete activities outlined in the elements and performance criteria of this unit</i> - <i>manage these activities and any contingencies in the context of the academic learning / work environment.</i> <p><i>There must be demonstrated evidence that the learner has completed the following:</i></p> <ul style="list-style-type: none"> • Applied chemical science theory and methodology including complex reasoning to solve problems • Constructed information from relevant data and interpreted chemical information in tabular, graphical, diagrammatic or sequence form • Obtained and assessed value of relevant data/information from a minimum of three (3) reputable sources • Collected, analysed, evaluated, documented and presented data/information in accordance with discipline and academic purpose • Investigated a contemporary application of chemical science research work, including ethical issues where these exist • Delivered oral presentation on chemical science topic with coherence, clear communication and use of correct terminology • Applied safe work and procedural compliance practices in laboratory/field study environments <p>Note: If a specific volume or frequency is not stated, then the evidence must be provided at least once.</p>
KNOWLEDGE EVIDENCE	<p><i>The learner must be able to:</i></p> <ul style="list-style-type: none"> • <i>demonstrate essential knowledge required to effectively undertake the activities outlined in the elements and performance criteria of this unit</i> • <i>manage these activities and any contingencies in the context of the academic learning / work environment.</i> <p><i>This includes knowledge of:</i></p> <ul style="list-style-type: none"> • Relevant chemical science theory (facts, principles, theories, formulae, procedures) and associated terminology • Methodology including: scientific method; complex reasoning processes, evidence evaluation

	<ul style="list-style-type: none"> • Graphical, statistical information; research data relevant to chemical science • Document structure and format in accordance with discipline and academic purpose • Organisational procedures including safety measures for working in field/laboratory environments • Contemporary/ethical issues in chemical science
ASSESSMENT CONDITIONS	<p>A range of assessment methods must be used to assess both practical skills and knowledge.</p> <p><i>The range of assessment methods may be in the form of a selected combination from:</i></p> <ul style="list-style-type: none"> • Observation and direct questioning • Questions requiring oral / written answers eg short answer; multiple choice; matching / gap-fill; extended answers; diagrammatic; tabular; sequence form answers • Computer based tasks / activities • Practical assessment events (eg laboratory work) • Workbook records • Assignment/s and reports • Oral, prepared presentations relevant to discipline • Research activities • Group-based assessment events incorporating individual assessment of process/product • Individual, authenticated portfolio • Relevant and specific third party reports (eg from a supervisor) and/or testimonials • Authenticated reports of achievement in relevant courses or training sessions (RPL / Credit transfer) <p>Skills must be demonstrated in the context of an actual or simulated academic workplace/learning environment with access to all relevant equipment and resources of that environment.</p>

	<p>Holistic/integrated assessment of relevant components within this enterprise unit and/or with other relevant units is recommended, where practicable.</p> <p>All assessment must be completed in accordance with relevant academic workplace/learning environment health and safety standards.</p> <p>Assessor Requirements:</p> <p>Assessors must satisfy assessor requirements in the <i>Standards for Registered Training Organisations (RTOs) 2015</i></p>
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