



CHRISTIAN HERITAGE COLLEGE

**SC130**

**PHYSICAL AND CHEMICAL SCIENCES (7-10)**

This sample unit outline is provided by CHC for prospective and current students to assist with unit selection.

Elements of this outline which may change with subsequent offerings of the unit include Content, Required Texts, Recommended Readings and details of the Assessment Tasks.

Students who are currently enrolled in this unit should obtain the outline for the relevant semester from the unit lecturer.

<b>Unit code</b>	SC130								
<b>Unit name</b>	Physical and Chemical Sciences (7-10)								
<b>Associated higher education awards</b>	Bachelor of Education (Secondary) Bachelor of Arts/Bachelor of Education (Secondary)								
<b>Duration</b>	One semester								
<b>Level</b>	Intermediate								
<b>Core/elective</b>	Elective for Science teaching area/Science minor								
<b>Weighting</b>	Unit credit points: 10 Course credit points: 320								
<b>Delivery mode</b>	Internal								
<b>Student workload</b>	<p><i>Face-to-face on-site</i></p> <table> <tr> <td>Contact hours</td> <td>30 hours</td> </tr> <tr> <td>Reading, study, preparation</td> <td>50 hours</td> </tr> <tr> <td>Assignment preparation</td> <td>70 hours</td> </tr> <tr> <td><b>TOTAL</b></td> <td><b>150 hours</b></td> </tr> </table> <p>Students requiring additional English language support are expected to undertake an additional one hour per week.</p>	Contact hours	30 hours	Reading, study, preparation	50 hours	Assignment preparation	70 hours	<b>TOTAL</b>	<b>150 hours</b>
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<b>TOTAL</b>	<b>150 hours</b>								
<b>Prerequisites/ co-requisites/ restrictions</b>	Nil								
<b>Rationale</b>	<p><b>Enduring Understanding:</b></p> <p>Effective science teachers are scientifically knowledgeable and literate and confident in a range of pedagogies that motivate learners and promote scientific inquiry into God's creation.</p> <p>Developing engaging practices in the classroom will encourage secondary (Years 7-10) students to participate in scientific inquiry processes. Pre-service teachers will be equipped to encourage students to develop an ongoing interest in science.</p> <p>This unit will prepare pre-service teachers to engage learners with the scientific strands of chemistry and physics within the Australian Curriculum in conjunction with developing pedagogical practice and revelation of Christian worldview perspectives.</p>								
<b>Learning delivery process</b>	<p><b>Internal: Face-to-face mode:</b></p> <p>Interactive engagement through face-to face lectures and access to all on-line resources:</p> <ul style="list-style-type: none"> <li>• Weekly lecture.</li> <li>• Weekly tutorial (where applicable).</li> </ul> <p>Plus on-line resources (see below).</p>								

	<p><b>On-line resources:</b></p> <ul style="list-style-type: none"> <li>• CHC learning portal (Moodle™): <ul style="list-style-type: none"> <li>– weekly lecture (may include lecture video capture (eg: Echo360), Power Point presentation and resources);</li> <li>– weekly readings;</li> <li>– study guides; and</li> <li>– assessment guides.</li> </ul> </li> <li>• Collaborative forums: Student forums and News forum.</li> <li>• Turnitin assessment and feedback tool.</li> </ul> <p>All unit outlines are reviewed prior to the offering of the unit to take account of student and lecturer feedback.</p>
<p><b>Learning outcomes</b></p>	<p>On completion of this unit, pre-service teachers will have provided evidence that they have:</p> <ol style="list-style-type: none"> <li>1. developed Australian Curriculum chemical and physical Science content knowledge and understanding for years 7-10 (GTS 3.1; GA 4, 7);</li> <li>2. acquired and applied scientific inquiry skills for physical and chemical science (GTS 2.1, GA 4, 7);</li> <li>3. developed innovative teaching strategies for teaching physical and chemical sciences in the Years 7-10 context (GTS 2.1; GA 1, 4);</li> <li>4. examined chemical and physical science applications as a human endeavour (GTS 2.5, 2.6, 4.5; GA 1, 4);</li> <li>5. investigated the ways physical and chemical sciences reveal God's order in creation (GA 3); and</li> <li>6. communicated at an appropriate tertiary standard, with special attention to design elements, grammar usage, logical relations, style, referencing and presentation (GA 6).</li> </ol>
<p><b>Content</b></p>	<ol style="list-style-type: none"> <li>1. Australian Curriculum Science Understandings 7-10 (Physical and Chemical Sciences): <ol style="list-style-type: none"> <li>a) Year 7 – Mixtures, solutions and separation processes, forces and gravity;</li> <li>b) Year 8 – States of matter, elements, compounds and mixtures, chemical change, energy forms and transformation;</li> <li>c) Year 9 – Atomic structure, chemical reactions (acid/base, combustion), energy transfer: heat, electricity, sound and light;</li> <li>d) Year 10 – Atomic structure and periodic table patterns, chemical reaction rate and balancing equations, energy conservation and systems, simple motion.</li> </ol> </li> <li>2. Science inquiry skills: Questioning, predicting; planning and conducting; data collecting, analysis and processing; evaluating; communicating.</li> <li>3. Science as a human endeavour real-world application, influence upon society.</li> <li>4. Teaching strategies especially upon laboratory practice.</li> <li>5. Laboratory safety and risk management.</li> <li>6. Christian worldview integration and revelation of God's created order.</li> </ol>
<p><b>Assessment tasks</b></p>	<p><b>Task 1: Experimental Reports</b></p> <p>Undertake three practical scientific investigations and write individual experimental reports. Investigative areas include Chemical reactions; Chemical Energy transformations; Simple motion studies and energy topic practical demonstration.</p> <p>Word Length/Duration: 3x1,000 words</p> <p>Weighting: 60% total (3x20%)</p> <p>Assessed: Throughout semester weeks 1-9</p> <p><b>Task 2: Examination</b></p> <p>Examination of content, knowledge and understandings, and scientific skills drawn from Australian Curriculum Chemical and physical science 7-10 learning areas.</p> <p>Word Length/Duration: 3 hours</p> <p>Weighting: 40%</p> <p>Assessed: Examination week</p>

Assessment alignment	Assessment Task	Learning Outcome	Content	Graduate Teacher Standards
	Task 1	1-6	1-6	2.1, 3.3, 3.4
	Task 2	1-6	1-6	2.1
<b>Prescribed text(s)</b>	Nil. Selected readings will be available via the Moodle™ site for this unit.			
<b>Recommended readings</b>	<p><b>Curriculum Readings</b></p> <p>Blackman, A., Bottle, S., Schmid, S., Mocerino, M., &amp; Wille, U. (2016). <i>Chemistry</i>. (3rd ed.). Milton, QLD: John Wiley and Sons.</p> <p>Bonomo, R., Tabbi, G., &amp; Guiffrida, A. (2013). <i>A conceptual approach to the teaching of chemistry</i>. New York, NY: Novinka.</p> <p>Bowman, M. &amp; Haysom, J. (2014). <i>Predict, observe, explain: Activities enhancing science understanding</i>. Moorabbin, VIC: Hawker Brownlow Education.</p> <p>Halliday, D., Resnick, R., &amp; Walker, J. (2014). <i>Fundamentals of physics</i>. (10th ed.). Milton, QLD: John Wiley and Sons.</p> <p>Mader, J. &amp; Winn, M. (2012). <i>Teaching physics for the first time</i>. (2nd ed.). College Park, MD: American Association of Physics Teachers.</p> <p>Young, S. (2016). <i>Gourmet Lab: The scientific principles behind your favourite foods</i>. Moorabbin, VIC: Hawker Brownlow Education.</p> <p><b>Journals and Periodicals</b></p> <p>The Australian Science Teachers' Journal</p> <p>Journal of Technology Education</p> <p>Perspectives on Science and Christian Faith</p> <p>Christian</p> <p><b>Websites</b></p> <p>Australian Academy of Science:  <a href="https://www.science.org.au/">https://www.science.org.au/</a></p> <p>Commonwealth Scientific and Industrial Research Organisation:  <a href="https://www.csiro.au/">https://www.csiro.au/</a></p> <p>Scoutle Science:  <a href="https://www.scoutle.edu.au/ec/search?q=science&amp;field=title&amp;field=text.all&amp;field=topic">https://www.scoutle.edu.au/ec/search?q=science&amp;field=title&amp;field=text.all&amp;field=topic</a></p> <p>Australian Science Teachers Association:  <a href="http://asta.edu.au/">http://asta.edu.au/</a></p> <p>Australasian Science Magazine:  <a href="http://www.australasianscience.com.au/">www.australasianscience.com.au/</a></p> <p>ABC Science Online:  <a href="http://www.abc.net.au/science">www.abc.net.au/science</a></p> <p>ABC Science Online:  <a href="http://www.abc.net.au/science">www.abc.net.au/science</a></p>			

	<p>In addition to the resources above, students should have access to a Bible, preferably a modern translation such as The Holy Bible: The New International Version 2011 (NIV 2011) or The Holy Bible: New King James Version (NKJV).</p> <p>These and other translations may be accessed free on-line at <a href="http://www.biblegateway.com">http://www.biblegateway.com</a>. The Bible app from LifeChurch.tv is also available free for smart phones and tablet devices.</p>
<b>Specialist resource requirements</b>	Nil
<b>Unit summary</b>	This unit will prepare pre-service teachers to engage learners with the scientific strands of chemistry and physics within the Australian Curriculum in conjunction with developing pedagogical practice and revelation of Christian worldview perspectives.

SAMPLE