



CHRISTIAN HERITAGE COLLEGE

**CR172**

## **INTRODUCTION TO SCIENCE AND TECHNOLOGIES**

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>	CR172
<b>Unit name</b>	Introduction to Science and Technologies
<b>Associated higher education awards</b>	Bachelor of Education (Primary)
<b>Duration</b>	One semester
<b>Level</b>	Introductory
<b>Core/elective</b>	Core
<b>Weighting</b>	Unit credit points: 10 Course credit points: Bachelor of Education (Primary) 320
<b>Delivery mode</b>	Face-to-face on site
<b>Student workload</b>	<p><i>Face-to-face on site</i></p> <p>Contact hours 39 hours Reading, study and assignment preparation 111 hours <b>TOTAL 150 hours</b></p> <p>Students requiring additional English language support are expected to undertake an additional one hour per week.</p>
<b>Prerequisites/ co-requisites/ restrictions</b>	Nil
<b>Rationale</b>	<p><u>Enduring Understanding:</u> Appreciation for key principles and theories relating to biological, chemical, physical, and earth and space science fields of investigation is essential for teaching science and technologies.</p> <p>Effective teachers of Science in the Prep-Year 2 and Year 3-6 contexts need a sound knowledge and understanding of scientific principles and require the development of skills and abilities in the processes of scientific and technological inquiry. This unit will investigate contemporary curriculum, pedagogies and ways of thinking and working scientifically that will enhance pre-service teachers' engagement in explorations within the four strands of the science curriculum. Pre-service teachers will also investigate the role of ICTs that complement scientific inquiry. Through inquiry based investigations and activities, pre-service teachers will explore pedagogies and practices for effective teaching of science and technologies within a Christian worldview perspective.</p>
<b>Prescribed text(s)</b>	<p>Moomaw, S. (2013). <i>Teaching STEM in the early years: Activities for integrating science, technology, engineering, and mathematics</i>. St. Paul, MN: Redleaf Press.</p> <p>Selected readings will be available via the Moodle™ site for this unit.</p>
<b>Recommended readings</b>	<p><b>Books</b></p> <p>Aitken, J. (2012). <i>A sense of wonder: Science in early childhood education</i>. Albert Park, VIC: Teaching Solutions.</p> <p>Australian Academy of Science. (2006). <i>Primary connections: Linking science with literacy</i>. Canberra, ACT: Department of Education, Employment &amp; Workplace Relations.</p>

	<p>Boss, S., &amp; Krauss, J. (2014). <i>Reinventing project-based learning: Your field guide to real-world projects in the digital age</i> (2nd ed.). Eugene, OR: International Society for Technology in Education.</p> <p>Giberson, K. (2012). <i>The wonder of the universe: Hints of God in our fine-tuned world</i>. Downers Grove, IL: IVP Books.</p> <p>Hewitt, P.G., Lyons, S., Suchocki, J., &amp; Yeh, J. (2013). <i>Conceptual integrated science</i> (2nd ed.) San Francisco, CA: Pearson.</p> <p>James, A.N. (2009). <i>Teaching the female brain: How girls learn math and science</i>. Thousand Oaks, CA: Corwin Press.</p> <p>Skamp, K., &amp; Preston, C. (2015). <i>Teaching primary science constructively</i> (5th ed.). South Melbourne, VIC: Cengage Learning.</p> <p><b>Journals</b></p> <p><i>The Australian Science Teachers' Journal</i></p> <p><i>Journal of Technology Education</i></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 (CSIRO)  <a href="http://www.csiro.au/">http://www.csiro.au/</a></p> <p>Scootle  <a href="https://www.scootle.edu.au/">https://www.scootle.edu.au/</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>Content</b>	<ol style="list-style-type: none"> <li>1. Science and technology as human practices</li> <li>2. Historical and cultural influences on science and technology; Aboriginal and Torres Strait Islander perspectives</li> <li>3. Principles of sustainability and stewardship in science and technology</li> <li>4. Scientific inquiry skills and processes, including safety; and scientific and technological investigations in the primary years</li> <li>5. Scientific data; qualitative and quantitative approaches to data collection, analysis and use</li> <li>6. Key concepts in biological sciences for primary years: including, living and non-living; and the needs of living organisms</li> <li>7. Key concepts in chemical sciences for primary years students: including, natural and processed materials; and reversible and non-reversible changes</li> <li>8. Key concepts in physical sciences for primary years: including, pushing and pulling; sinking and floating; and gravity and lift</li> <li>9. Key concepts in earth and space sciences for primary years: including, weather; riches under the ground; and observing the sky</li> <li>10. Pedagogical approaches including ICT pedagogies which engage and enhance childhood learning in science and technologies</li> <li>11. Key concepts in design and ICTs; including, design; systems; and preferred futures</li> </ol>

<b>Learning outcomes</b>	<p>On completion of this unit, pre-service teachers will have provided evidence that they have:</p> <ol style="list-style-type: none"> <li>developed an understanding of the key concepts of science for the primary years; including biological, chemical, earth and space and physical sciences;</li> <li>developed knowledge and understanding of the key concepts of technology for the primary years; including design and digital technologies;</li> <li>understood the basic principles of scientific investigation and inquiry, and its importance in seeking answers to questions about the physical universe;</li> <li>described, applied, and explained scientific inquiry skills and processes for investigating in science and technologies for primary aged children;</li> <li>developed literacy, numeracy, and ICT pedagogies specific to engaging in science and technology; and</li> <li>communicated at an appropriate tertiary standard: with special attention to design elements, grammars, usage, logical relations, style, referencing and presentation.</li> </ol>						
<b>Assessment tasks</b>	<p><b>Task 1: Technology Investigation</b></p> <p>Word Length/Duration: 1,500 words</p> <p>Weighting: 50%</p> <p>Learning Outcomes: 1, 3, 5-6</p> <p>Assessed: Week 7</p> <p><b>Task 2: Science Investigation</b></p> <p>Word Length/Duration: 1,500 words</p> <p>Weighting: 50%</p> <p>Learning Outcomes: 1, 2, 4, 6</p> <p>Assessed: Week 14</p>						
<b>Australian Professional Standards for Teachers (APST)</b>	<p>The learning opportunities provided in this unit contribute to the development of practice, knowledge and values of the following <i>Australian Professional Standards for Teachers</i>:</p> <ol style="list-style-type: none"> <li>2.1 Content and teaching strategies of the teaching area</li> <li>2.5 Literacy and numeracy strategies</li> <li>2.6 Information and Communication Technology</li> <li>4.4 Maintain student safety</li> </ol> <p>Successful completion of this unit will provide significant evidence about the following <i>Australian Professional Standards for Teachers</i>:</p> <table border="1" data-bbox="384 1514 1439 1644"> <thead> <tr> <th data-bbox="384 1514 967 1581"><i>Graduate Teacher Standards</i></th> <th data-bbox="967 1514 1206 1581"><i>Learning Outcomes</i></th> <th data-bbox="1206 1514 1439 1581"><i>Assessment Tasks</i></th> </tr> </thead> <tbody> <tr> <td data-bbox="384 1581 967 1644">Not assessed in this unit</td> <td data-bbox="967 1581 1206 1644">N/A</td> <td data-bbox="1206 1581 1439 1644">N/A</td> </tr> </tbody> </table>	<i>Graduate Teacher Standards</i>	<i>Learning Outcomes</i>	<i>Assessment Tasks</i>	Not assessed in this unit	N/A	N/A
<i>Graduate Teacher Standards</i>	<i>Learning Outcomes</i>	<i>Assessment Tasks</i>					
Not assessed in this unit	N/A	N/A					
<b>Unit summary</b>	<p>Pre-service teachers should possess the skills and understandings needed to help their students to develop knowledge and appreciation of science and technology. These two related disciplines are ways that humankind makes sense of the world and creates solutions to various problems, skills which will be beneficial to school students and to those around them.</p>						