CHRISTIAN HERITAGE COLLEGE

CR275

ADVANCED STUDIES IN 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.

Unit code	CR275
Unit name	Advanced Studies in Science and Technologies
Associated higher education awards	Bachelor of Education (Primary)
Duration	One semester
Level	Intermediate
Core/elective	Core
Weighting	Unit credit points: 10 Course credit points: Bachelor of Education (Primary) 320
Delivery mode	Face-to-face on site
Student workload	*Face-to-face on site* Contact hours 30 hours Reading, study and assignment preparation 120 hours **TOTAL** **150 hours**
	Students requiring additional English language support are expected to undertake an additional one hour per week.
Prerequisites/ co-requisites/ restrictions	*Prerequisite:* CR172 Introduction to Science and Technologies
Rationale	Enduring Understanding: Science and technology provides people with unique ways to understand the world in which they live. Pre-service teachers need to be able to understand the principles of science and technology in order to engage students. This unit is the second of two science and technology content units that further develops understanding of scientific inquiry and technological applications and how they can be used to solve problems, contribute to innovation and effect change. The unit explores the various philosophies of science and their effect on the processes of scientific discovery from a Christian worldview perspectives.
Prescribed text(s)	Selected readings will be available via the Moodle™ site for this unit.
Recommended readings	**Books** Boss, S., & Krauss, J. (2014). *Reinventing project-based learning: Your field guide to real-world projects in the digital age* (2nd ed.). Eugene, OR: International Society for Technology in Education. Hewitt, P.G., Lyons, S., Suchocki, J., & Yeh, J. (2013). *Conceptual integrated science* (2nd ed.). San Francisco, CA: Pearson. McLeish, T. (2014). *Faith and wisdom in science*. Oxford, UK: Oxford University Press. Moomaw, S. (2013). *Teaching STEM in the early years: Activities for integrating science, technology, engineering, and mathematics*. St. Paul, MN: Redleaf Press. Skamp, K., & Preston, C. (Eds.) (2015). *Teaching primary science constructively* (5th ed.). South Melbourne, VIC: Cengage Learning. Vasquez, J.A., Comer, M., & Sneider, C. (2013). *STEM lesson essentials, grades 3-8: Integrating science, technology, engineering, and mathematics*. Portsmouth, NH: Heinemann.

	Journals *The Australian Science Teachers' Journal* *Journal of Educational Technology* **Websites** Australian Academy of Science https://www.science.org.au/ Commonwealth Scientific and Industrial Research Organisation (CSIRO) http://www.csiro.au/ Scootle https://www.scootle.edu.au/ Australian Science Teachers Association www.asta.edu.au Australasian Science Magazine www.australasianscience.com.au ABC Science Online www.abc.net.au/science In addition to the resources above, pre-service teachersteachers 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). These and other translations may be accessed free on-line at http://www.biblegateway.com. The Bible app from LifeChurch.tv is also available free for smart phones and tablet devices.
Specialist resource requirements	Nil
Content	1. Philosophies of science and the scientific inquiry 2. Common misconceptions in science and technology 3. Key concepts in science: Biology, chemistry, physics, earth and space sciences 4. Key concepts in technology: Design, systems, management, preferred futures 5. Laboratory experiences: Biology, chemistry, physics, earth and space sciences 6. Technology experiences and investigations e.g. food and materials 7. Perspectives on science and technology e.g. Aboriginal and Torres Strait Islander, Christian worldview 8. Ethical dilemmas in science and technology 9. Developing scientific and technological literacies 10. Using a range of ICTs and pedagogies to support approaches to learning science and technology
Learning outcomes	On completion of this unit, pre-service teachers will have provided evidence that they have: 1. further developed their knowledge and understanding of the key conceptual areas of science and technology from a Christian worldview; 2. practiced the core skills and processes of scientific inquiry; 3. demonstrated the design, manufacture and appraisal processes in the development of technological products; 4. applied scientific and technological processes and practices in the development of authentic learning experiences; 5. evaluated alternative views, including Aboriginal and Torres Strait Islander perspectives, on the nature and uses of science and technology; and 6. communicated at an appropriate tertiary standard: with special attention to design elements, grammars, usage, logical relations, style, referencing and presentation.

<table>
<tr><td>Assessment tasks</td><td>
Task 1: Laboratory Report
Word Length/Duration: 1,000 words
Weighting: 20%
Learning Outcomes: 1-4, 6
Assessed: Weeks 2, 4, 6, 8
Task 2: Laboratory Investigation
Conduct an investigation and prepare a technological solution report
Word Length/Duration: 1,500 words
Weighting: 40%
Learning Outcomes: 1, 2, 4, 6
Assessed: Week 7
Task 3: Group Presentation and Individual Report
Presentation of a mini lesson of a laboratory investigation incorporating ICT resources.
Word Length/Duration: 15 minutes 1,500 words
Weighting: 40%
Learning Outcomes: 1-6
Assessed: Week 16
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<tr><td rowspan="3">Australian Professional Standards for Teachers (APST)</td><td>
The learning opportunities provided in this unit contribute to the development of practice, knowledge and values of the following Australian Professional Standards for Teachers:
2.1 Content and teaching strategies of the teaching area
2.5 Literacy and numeracy strategies
2.6 Information and Communication Technology
4.4 Maintain student safety
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Successful completion of this unit will provide significant evidence about the following Australian Professional Standards for Teachers:
<table>
<tr><td>Graduate Teacher Standards</td><td>Learning Outcomes</td><td>Assessment Tasks</td></tr>
<tr><td>Not assessed in this unit</td><td>N/A</td><td>N/A</td></tr>
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<tr><td>Unit summary</td><td>Pre-service teachers will develop skills and understandings needed to help primary students develop knowledge and appreciation of science and technology. These two related disciplines help humankind to make sense of the world and develop solutions to various problems.</td></tr>
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