



CHRISTIAN HERITAGE COLLEGE

**CR161**

## **INTRODUCTION TO MATHEMATICS AND NUMERACY**

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>	CR161						
<b>Unit name</b>	Introduction to Mathematics and Numeracy						
<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> <table> <tr> <td>Contact hours</td><td>30 hours</td></tr> <tr> <td>Reading, study and assignment preparation</td><td>120 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 and assignment preparation	120 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>	<p><i>Prerequisite:</i></p> <p>CR111 Introduction to Cross-Curricular Literacies</p>						
<b>Rationale</b>	<p><u>Enduring Understanding:</u> Mathematics is a tool to solve problems in the created universe in ways that are of immense use to humankind.</p> <p>This is the first of two core units for pre-service teachers in mathematics. It introduces pre-service teachers to the discipline content of the Australian Curriculum: Mathematics within the content strands of number and algebra, measurement and geometry, and statistics and probability. The unit equips pre-service teachers to assist school students to develop numeracy and a broad and coherent understanding of mathematics, including numeration.</p> <p>There is widespread agreement that exploration of numeracy is a current priority for education, and that teachers need to have well-developed personal numeracy in order to expertly teach school students. This unit will equip pre-service teachers to recognise opportunities to integrate mathematics into other curriculum areas.</p>						
<b>Prescribed text(s)</b>	Selected readings will be available via the Moodle™ site for this unit.						
<b>Recommended readings</b>	<p><b>Books</b></p> <p>Attard, C. (2013). <i>Engaging maths: Higher order thinking with thinkers keys</i>. Alexandria, NSW: SOS Media.</p> <p>Caldwell, S. (2012). <i>Statistics unplugged</i> (4th ed.). Belmont, CA: Wadsworth Cengage Learning.</p> <p>Clausen-May, T. (2013). <i>Teaching mathematics visually &amp; actively</i> (2nd ed.). London, UK: SAGE Publications.</p> <p>MacDonald, A., &amp; Rafferty, J. (2015). <i>Investigating mathematics, science and technology in early childhood</i>. South Melbourne, VIC: Oxford University Press.</p>						

	<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>O'Brien, H., &amp; Purcell, G. (2013). <i>The new primary mathematics handbook: Australian curriculum edition</i> (4th ed.). South Melbourne, VIC: Oxford University Press.</p> <p>Rosen, K. (2012). <i>Discrete mathematics and its applications</i> (7th ed.). New York, NY: McGraw Hill.</p> <p>Simeon, D., Beswick, K., Brady, K., Faragher, R., &amp; Warren, E. (2011). <i>Teaching mathematics: Foundations to middle years</i>. South Melbourne, VIC: Oxford University Press.</p> <p><b>Journals</b></p> <p><i>The Arithmetic Teacher</i></p> <p><i>Mathematics Teacher</i></p> <p><i>School Science and Mathematics</i></p> <p><i>Teaching Children Mathematics</i></p> <p><b>Websites</b></p> <p>Australian Curriculum  <a href="http://www.australiancurriculum.edu.au/mathematics/curriculum/">http://www.australiancurriculum.edu.au/mathematics/curriculum/</a></p> <p>Australian Curriculum Lessons  <a href="http://www.australiancurriculumlessons.com.au/category/mathematics-lessons/">http://www.australiancurriculumlessons.com.au/category/mathematics-lessons/</a></p> <p>Queensland Association of Mathematics Teachers  <a href="http://www.gamt.org/">http://www.gamt.org/</a></p> <p>Australian Association of Mathematics Teachers  <a href="http://www.aamt.edu.au/">http://www.aamt.edu.au/</a></p> <p>Queensland Curriculum and Assessment Authority  <a href="https://www.qcaa.qld.edu.au/">https://www.qcaa.qld.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>	Scientific calculator
<b>Content</b>	<ol style="list-style-type: none"> <li>1. The relationship between mathematics and numeracy</li> <li>2. Use of ICTs with mathematical concepts and learning experiences</li> <li>3. Representations of numbers: concrete, symbolic and verbal</li> <li>4. Computation methods: mental, digital and written</li> <li>5. Patterns and functions</li> <li>6. Equivalence and equations</li> <li>7. Geometry key terminology and concepts</li> <li>8. Geometric reasoning</li> <li>9. Measurement concepts and processes</li> <li>10. The SI (Metric) system of measurement units</li> <li>11. Data collection, analysis and representation</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>1. developed knowledge and understanding across all conceptual areas relevant to mathematics in the compulsory years of education;</li> <li>2. understood the nature of mathematical concepts, including the ability to conceptualise the abstract nature of mathematical objects and discern the mathematics represented by mathematical symbols;</li> <li>3. identified key components of numeracy, incorporating the ability to use and explain a wide range of mathematical skills, methods, structures and tools flexibly in practical applications; covering number facts, computation, algebra, probability, measurement and problem-solving;</li> <li>4. explored and critiqued mathematics learning experiences which encourage deep learning;</li> <li>5. engaged with and critiqued the use of digital technologies in mathematics learning experiences; and</li> <li>6. 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: Investigation</b></p> <p>Mathematical investigation of digital tools and resources that develop personal mathematics and numeracy</p> <p>Word Length/Duration: 1,500 words</p> <p>Weighting: 40%</p> <p>Learning Outcomes: 1-6</p> <p>Assessed: Week 8</p> <p><b>Task 2: Examination</b></p> <p>Covering discipline content knowledge for all content components of the Mathematics curriculum: Number and Algebra, Measurement and Geometry, Statistics and Probability.</p> <p>Word Length/Duration: 3 hours</p> <p>Weighting: 60%</p> <p>Learning Outcomes: 1-6</p> <p>Assessed: Week 16</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> <p>2.1 Content and teaching strategies of the teaching area</p> <p>2.5 Literacy and numeracy strategies</p> <p>2.6 Information and Communication Technology</p>		
	<p>Successful completion of this unit will provide significant evidence about the following <i>Australian Professional Standards for Teachers</i>:</p>		
	<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>This is the first of two core units for pre-service teachers in mathematics. It introduces pre-service teachers to the discipline content of the Australian Curriculum: Mathematics within the content strands of number and algebra, measurement and geometry, and statistics and probability. The unit equips pre-service teachers to assist school students to develop numeracy and a broad and coherent understanding of mathematics, including numeration.</p>		