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.
<table>
<thead>
<tr>
<th><strong>Unit Name</strong></th>
<th>Introduction to Mathematics and Numeracy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit Code</strong></td>
<td>CR161</td>
</tr>
<tr>
<td><strong>Awards</strong></td>
<td>Bachelor of Education (Primary)</td>
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<td></td>
<td>Bachelor of Education (Middle Years)</td>
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<tr>
<td></td>
<td>Bachelor of Arts/Bachelor of Education (Secondary) - Mathematics minor</td>
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<tr>
<td><strong>Core/Elective</strong></td>
<td>Core</td>
</tr>
<tr>
<td><strong>Prerequisite</strong></td>
<td>CR111 Introduction to Cross-Curricular Literacies (pass Numeracy component)</td>
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<tr>
<td><strong>Mode</strong></td>
<td>Internal</td>
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<tr>
<td><strong>Weighting</strong></td>
<td>10 credit points</td>
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<tr>
<td><strong>Delivery/Contact hrs</strong></td>
<td>Class contact 33 hours</td>
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<tr>
<td></td>
<td>Engagement with unit materials readings 44 hours</td>
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<tr>
<td></td>
<td>Assignment preparation 63 hours</td>
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<td></td>
<td>Total 140 hours</td>
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<tr>
<td><strong>Teaching Staff</strong></td>
<td>Dr Peter Price</td>
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</table>

**Unit Rationale**
This is the first of two core units for preservice teachers in Mathematics. It introduces preservice teachers to the discipline content of the five mathematics curriculum strands: number, algebra, space, measurement, and chance and data. The unit equips preservice teachers to assist school students to develop numeracy and a broad understanding of mathematics, including numeration, computation, algebra, geometry, measurement, chance and data.

There is widespread agreement that development of numeracy is a current priority for education, and therefore that teachers need to have well-developed personal numeracy in order to expertly teach school students. This unit will equip preservice teachers to recognise opportunities in other curriculum areas to incorporate numeracy and mathematics in a meaningful, 'natural' way so that mathematics is effectively integrated with other curriculum areas.

**Learning Outcomes:**

On completion of this unit, preservice teachers will have provided evidence that they have:

1. Understood mathematical concepts, including the ability to conceptualise the abstract nature of mathematical objects and visualise the mathematics represented by mathematical symbols.
2. Identified the literate, numerate and digital demands expected of students engaging in learning in the Mathematics learning area.
3. Engaged with pedagogical strategies, tools and resources mediated through ICT technologies, relevant to the Mathematics learning area.
4. Demonstrated a high level 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.
5. Constructed a sound knowledge base across all conceptual areas relevant to Mathematics as a key learning area in the compulsory years of education.
6. Developed familiarity with the scope and sequence of mathematics topics included in state and national curriculum documentation.
7. Planned and implemented mathematics learning experiences which encourage deep learning in mathematics, rather than copying routine procedures, while incorporating appropriate available digital technologies.
8. Written at an appropriate tertiary standard: (with special attention to correct grammar, punctuation, spelling, vocabulary, usage, sentence structure, logical relations, style, referencing and presentation).
## Content:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
</table>
| 1    | Introduction to Mathematics  
- Curriculum documentation: key concepts and processes  
- The relationship between Mathematics and numeracy  
- Number sense and developing numeracy  
- Electronic computation and its effect on pedagogy and content  
- Use of ICTs to develop numeracy in mathematics lessons |
| 2-3  | Understandings of ‘Number’  
- Representations of numbers; concrete, symbolic and verbal;  
- Use of ICTs to represent numbers  
- Proportional thinking: common, decimal and percentage fractions  
- Money |
| 4    | Understandings of ‘Algebra’  
- Patterns and Functions  
- Equivalence and Equations  
- ICT support for algebraic learning |
| 5-6  | Understandings of ‘Computation’  
- Computation methods: mental, digital, written  
- Teaching addition and subtraction  
- Teaching multiplication and division |
| 7-8  | Understandings of ‘Space’  
- Introduction to geometry; key terminology and concepts  
- Symmetry and tessellations; transformational geometry |
| 9-10 | Understandings of ‘Measurement’  
- Introduction to measurement concepts and processes  
- Real-world use of measurement for problem-solving  
- The SI (Metric) system of measurement units; applications of measurement and formulas |
| 11   | Understandings of ‘Chance and Data’  
- Data collection, analysis and representation  
- describing data sets; measures of central tendency;  
- use of ICTs with data  
- Probability - qualitative and quantitative |

### Set Text Requirements:


All state and national syllabus documentation, including:

- Early Years Curriculum Guide: Early mathematical understandings  
- Year 1 Learning Statements: Early mathematical understandings  
- Essential Learnings: Mathematics  
- Essential Learnings: Numeracy Indicators  
- Australian Curriculum: Mathematics
Recommended Readings:


Journals

*The Arithmetic Teacher*

*Mathematics Teacher*

*School Science and Mathematics*

*Teaching Children Mathematics*

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**Assessment:**

<table>
<thead>
<tr>
<th>Assessment Item</th>
<th>Topic/s</th>
<th>Learning Outcomes assessed</th>
<th>Week Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Plan and Resources (1000 words)</td>
<td>Plan and implement a suitably resourced short teaching episode involving one of the Mathematics topics listed above, incorporating the use of appropriate ICTs. Develop a rationale that explains the relevant discipline content and how the pedagogical strategies select support learning of the concept.</td>
<td>1-3, 6-8</td>
<td>Weeks 4-11</td>
<td>20%</td>
</tr>
<tr>
<td>STEP Activity and Report (1000 words)</td>
<td>Conduct and report on two STEP activities relating to the Mathematics. The activities must incorporate engagement with a child. The report should describe the experience and reflect upon its relevance to numeracy and Mathematics.</td>
<td>1-4, 7-8</td>
<td>Week 11</td>
<td>10%</td>
</tr>
</tbody>
</table>
| Examination (2 x 2 hours) | Covering discipline content knowledge for all content components of the Mathematics curriculum;  
*Part A:* Number and algebra  
*Part B:* Measurement, Space, and Chance and Data | 1-8 | Part A: Week 6  
Part B: Exam Week | Part A: 30%  
Part B: 30% |
Unit Overview:

This unit will develop preservice teachers’ discipline content knowledge of the broad range of Mathematics topics in all strands of current Queensland and Australian curriculum documents. Preservice teachers’ previously learned knowledge of content and procedures will be reinforced, with an emphasis on appropriate understanding of the underlying Mathematics in order to teach these topics.