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 Name: Curriculum and Pedagogy: Mathematics and Numeracy

Unit Code: CR262

Awards: Bachelor of Education (Primary), Bachelor of Education (Middle Years), Bachelor of Arts/Bachelor of Education (Secondary) - Mathematics minor

Core/Elective: Core

Prerequisite: CR161 Introduction to Mathematics and Numeracy

Mode: Internal

Weighting: 10 credit points

Delivery/Contact hrs:
- Class contact: 33 hours
- Engagement with unit materials readings: 44 hours
- Assignment preparation: 63 hours
- Total: 140 hours

Teaching Staff: Dr Peter Price

Unit Rationale:
This unit, the second core unit for preservice teachers of P-9 mathematics, introduces preservice teachers to the methods and attitudes of effective mathematics education, following their study of the discipline content of the mathematics curriculum in the previous unit, CR161.

Preservice teachers will be introduced to the pedagogy of mathematics, including key terminology, sequencing of content within topics and issues of common misconceptions and limited understanding in school students, revealed in the mathematics education literature. Issues including the distinctions and links between mathematical knowledge and numeracy, the place of materials and technology, and the social dimensions of mathematics lessons will be investigated.

Critical issues of teaching for the development of a broad and useful numeracy will be addressed, and linked to recommendations in current Queensland and Australian curriculum documents. An emphasis is given to development of personal numeracy and number sense on the part of preservice teachers, rather than merely training to follow procedures without such understanding.

Learning Outcomes:

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

1. Engaged with a diverse range of problem-solving skills and developed an aptitude and attitude that is conducive to using mathematics to solve everyday problems.
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. Understood the appropriate use of quantitative data for problem solving and basic mathematical tools for its analysis.
5. Understood and applied appropriate pedagogical models for the teaching of key Mathematics topics, including computation, geometry and measurement.
6. Developed a sound understanding of mathematics pedagogy for planning and implementing Mathematics learning episodes which encourage deep learning, rather than copying routine procedures.
7. Developed teaching and learning strategies and resources to engage, support and assess school student learning and development in relation to literate, numerate and digital demands.
8. Developed strategies that promote positive attitudes among school students towards the study and use of mathematics.
9. Written at an appropriate tertiary standard (with special attention to correct grammar, punctuation, spelling, vocabulary, usage, sentence structure, logical relations, style, referencing and presentation).
Table:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction: contemporary issues in mathematics education</td>
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<tr>
<td>2</td>
<td>Understanding the development of mathematical thinking; key sequences of children’s thinking</td>
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<tr>
<td>3</td>
<td>The place of materials in representing mathematical concepts and skills</td>
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<td>4</td>
<td>The effect of the affective domain on the teaching and learning of mathematics; dealing with mathematics anxiety</td>
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<tr>
<td>5</td>
<td>Teaching for understanding rather than knowledge of standard routines</td>
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<tr>
<td>6</td>
<td>Pedagogical framework for teaching computation</td>
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<tr>
<td>7</td>
<td>Pedagogical frameworks for teaching geometry and measurement</td>
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<tr>
<td>8</td>
<td>Application of mathematics and numeracy across the curriculum; use of ICTs to develop numeracy and learn mathematics content and develop mathematical skills</td>
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<tr>
<td>9</td>
<td>Problem solving as a focus of mathematics education</td>
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<tr>
<td>10</td>
<td>Real-world use of probability and data collection concepts and processes to solve problems</td>
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<tr>
<td>11</td>
<td>Revision and Examination Preparation</td>
</tr>
</tbody>
</table>

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:


Curriculum Corporation 2000, *Numeracy Benchmarks Years 3, 5 & 7*,


**Journals**

*The Arithmetic Teacher*
*Mathematics Education Research Journal*
*Mathematics Teacher*
*School Science and Mathematics*
*Teaching Children Mathematics*

**Online Resources**


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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>Assessment Task and Guide to Making Judgements* (1000 words)</td>
<td>Design a learning and assessment activity to be used with school students that involves a real-world problem or inquiry, and involves appropriate use of ICTs. Prepare a task description for sharing with teachers, students and parents, along with a guide for making judgements about school students’ performances.</td>
<td>1-9</td>
<td>Week 4</td>
<td>25%</td>
</tr>
<tr>
<td>Learning Sequence* (2000 words)</td>
<td>Presentation of an innovative learning sequence, involving at least five developmental activities, designed to engage school students in mathematical thinking for one curriculum organiser, in which at least one activity involves substantial use of ICTs. Relevant resources should also be prepared and presented.</td>
<td>1-9</td>
<td>Weeks 6-9</td>
<td>25%</td>
</tr>
<tr>
<td>Examination (3 hours)</td>
<td>Covering pedagogical content knowledge for all content components of the Mathematics curriculum</td>
<td>1-9</td>
<td>Exam Week</td>
<td>50%</td>
</tr>
</tbody>
</table>

* These tasks are to address different organisers/strands in the Mathematics syllabus.

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**Unit Overview:**

This second core mathematics education unit develops and applies the content knowledge developed in CR161, equipping preservice teachers to design and implement engaging, relevant learning episodes for school students in the early and middle phases.