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>Mathematics for the Middle Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit Code</strong></td>
<td>CR263</td>
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</tbody>
</table>
| **Awards**    | Bachelor of Education (Primary) - Stream A: General Primary - Mathematics minor  
Bachelor of Education (Middle Years) - Mathematics minor  
Bachelor of Arts/Bachelor of Education (Secondary) - Mathematics minor |
| **Core/Elective** | Core - Bachelor of Education (Middle Years) - Mathematics minor  
Elective - Bachelor of Arts/Bachelor of Education (Secondary) - Mathematics minor |
| **Prerequisites** | CR161 Introduction to Mathematics and Numeracy  
CR262 Curriculum and Pedagogy: Mathematics and Numeracy |
| **Mode** | Internal |
| **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**

Middle Years mathematics teachers need a strong foundation of mathematics discipline knowledge, coupled with knowledge of appropriate mathematics pedagogy. This unit builds on introductory studies in mathematics education in CR161 and CR262, providing necessary knowledge and skills in the areas of number, algebra, geometry, and chance and data. The content is designed to prepare preservice teachers for the middle years curriculum, helping them to develop further their personal levels of numeracy and extending the skills and understanding developed in the earlier mathematics units. Appropriate use of ICTs will be an important emphasis in developing a relevant pedagogy for teaching middle years mathematics.

The middle years topics covered in this unit are in the areas of and processes involved in middle years level algebra, trigonometry, geometry, and chance and data. Extending the introductions to these topics included in CR161 and CR262. Study of these topics, beginning from the foundations in content studies and pedagogy studies in the earlier units, will equip preservice teachers to appropriately meet the demands of the middle years mathematics curriculum.

**Learning Outcomes:**

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

1. Attained personal knowledge of key concepts and processes involved in middle years level algebra, trigonometry, geometry, and chance and data.
2. Identified the literate, numerate and digital demands expected of students engaging in learning in the mathematics learning area.
3. Developed teaching and learning strategies and resources to engage, support and assess student learning and development in relation to literate, numerate and digital demands.
4. Developed proficiency in the use of a wide range of mathematical tools, including written, mental and electronic computation methods and formulas.
5. Developed proficiency in mathematical problem-solving methods.
6. Researched and designed an appropriate mathematics project which investigates a real-world problem at a level suitable for use with Mathematics learners in the middle phase of learning.
7. 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>
<tbody>
<tr>
<td>1</td>
<td>Introduction to middle years mathematics: the particular needs of students in this age group. The use of ICTs in presenting relevant, engaging mathematics lessons</td>
</tr>
<tr>
<td>2-3</td>
<td>Number: exponents, rate, ratio and proportion, rational and irrational numbers and scientific notation</td>
</tr>
<tr>
<td>4-5</td>
<td>Algebra: arithmetical principles, equations, relationships between quantities, variables and ordered pairs</td>
</tr>
<tr>
<td>6</td>
<td>Revision and consolidation of Number and Algebra topics for mid-semester examination</td>
</tr>
<tr>
<td>7-8</td>
<td>Geometry: specialised 2-D and 3-D figures, symmetry, congruence, angles, trigonometry, simple geometrical proofs and formulas for measuring polygons and polyhedra</td>
</tr>
<tr>
<td>9-10</td>
<td>Chance and Data: sample spaces, data collection and analysis, populations and samples, randomness, calculating probability, theoretical and experimental probability</td>
</tr>
<tr>
<td>11</td>
<td>Revision and consolidation of Geometry, and Chance and Data topics for final examination</td>
</tr>
</tbody>
</table>

Set Text Requirements:


Recommended Readings:


Brumbaugh, DK, Ortiz, E & Gresham, EH 2006, *Teaching Middle School Mathematics*, Lawrence Erlbaum, Mahwah, NJ.


Fosnot, CT & Dolk, M 2000, *Young Mathematicians at Work: Constructing Fractions, Decimals, and Percents*, Heinemann, Portsmouth, NH.


Kahover, B 2006, *Takehome Teacher: Middle School Math Explained*, Acacia, Phoenix, AZ.


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>Examination 1 (1500 words)</td>
<td>A mid-semester examination on number and algebra topics.</td>
<td>1-5, 7</td>
<td>Week 6</td>
<td>35%</td>
</tr>
<tr>
<td>Examination 2 (1500 words)</td>
<td>A final examination on geometry, and chance and data topics.</td>
<td>1-5, 7</td>
<td>Exam Week</td>
<td>35%</td>
</tr>
<tr>
<td>Mathematics Project (1500 words)</td>
<td>Students prepare a project, suitable for use in the middle phase of learning, which incorporates at least one major topic of this unit. The project is to be an investigation of a real-world problem which requires mathematical knowledge and skills at the appropriate level.</td>
<td>1-7</td>
<td>Week 15</td>
<td>30%</td>
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</table>

Unit Overview:

Preservice teachers who desire to be teachers of middle years mathematics develop their personal level of numeracy and their knowledge of key topics in algebra, geometry, trigonometry, and chance and data, extending their study of primary curriculum topics in CR161 and CR262.