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 code</strong></th>
<th>MT112</th>
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<tbody>
<tr>
<td><strong>Unit name</strong></td>
<td>Calculus 2</td>
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</table>
| **Associated higher education awards** | Bachelor of Education (Primary)  
Bachelor of Education (Secondary)  
Bachelor of Arts/Bachelor of Education (Secondary) |
| **Duration** | One semester |
| **Level** | Intermediate |
| **Core/Elective** | Required for a minor in Mathematics |
| **Weighting** | Unit credit points: 10  
Course credit points:  
Bachelor of Education (Primary) 320  
Bachelor of Education (Secondary) 320  
Bachelor of Arts/Bachelor of Education (Secondary) 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 |
| **Prerequisites/co-requisites/restrictions** | Prerequisite: MT110 Foundations of Mathematics |
| **Rationale** | According to the *The Mathematics? Why Not? Report*, prepared by the Australian Association of Mathematics Teachers and the University of New England, a key factor that deters students from studying higher level mathematics in senior secondary years is the large number of secondary teachers who are teaching mathematics outside their training and expertise. The authors state, “More than one-quarter of our junior secondary mathematics teachers have not even completed one year of university study in mathematics, making it difficult to engage students in a potentially demanding subject.”  
This unit extends the range of fundamental mathematical knowledge, understanding and skills available to students to enable them to analyse physical processes mathematically. Topics include complex numbers, integration, volume of revolution, improper integrals, differential equations, linear algebra, and probability. Students are afforded the opportunity not only to advance their knowledge and skills of these topics but also to explore their applications in many contexts, as well as continuing to develop their appreciation of the logic, order and consistency of such mathematical applications and how these reflect the character of God and His creation. |
Selected readings will be available via the Moodle™ site for this unit. |

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) 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** | Casio fx-82AU PLUS II scientific hand-calculator or equivalent |
| **Content** | 1. Complex Numbers  
2. Integration  
3. Differential equations  
4. Linear Algebra  
5. Probability |
| **Learning outcomes** | On completion of this unit, students will have demonstrated that they have:  
1. developed fluency in using differential and integral calculus, complex numbers, differential equations, linear algebra and probability;  
2. analysed mathematical problems to identify and apply relevant processes to solve such problems;  
3. appreciated the logic, order and consistency of mathematics in relation to its reflection of both the character of God and His creation;  
4. used appropriate strategies to effectively communicate relevant mathematical concepts and arguments using either written English or mathematical notations, as appropriate; and  
5. communicated at an appropriate tertiary standard: with special attention to design elements, grammars, usage, logical relations, style, referencing and presentation. |
| **Assessment tasks** | **Task 1: Folio**  
Word Length/Duration: 1 each week  
Weighting: 20%  
Learning Outcomes: 1, 2, 4  
Assessed: Weekly  
**Task 2: Investigation and design**  
Word Length/Duration: 2 hours  
Weighting: 30%  
Learning Outcomes: 1-5  
Assessed: Week 7 |
<table>
<thead>
<tr>
<th><strong>Task 3: Final Exam</strong></th>
<th><strong>Word Length/Duration:</strong> 3 Hours</th>
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<tbody>
<tr>
<td><strong>Weighting:</strong></td>
<td>50%</td>
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<tr>
<td><strong>Learning Outcomes:</strong></td>
<td>1-5</td>
</tr>
<tr>
<td><strong>Assessed:</strong></td>
<td>Examination Week</td>
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**Unit summary**

This course extends the range of fundamental mathematical techniques available to students to enable them to analyse physical processes mathematically. It will provide future teachers of mathematics, physics, or science sound knowledge and depth in their field.