



CHRISTIAN HERITAGE COLLEGE

MT112

CALCULUS 2

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 code	MT112
Unit name	Calculus 2
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	<i>Face-to-face on site</i> Contact hours 30 hours Reading, study and assignment preparation 120 hours TOTAL 150 hours Students requiring additional English language support are expected to undertake an additional one hour per week.
Prerequisites/ co-requisites/ restrictions	<i>Prerequisite:</i> MT110 Foundations of Mathematics
Rationale	According to the <i>The Mathematics? Why Not? Report</i> , 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.
Prescribed text(s)	Anton, H. & Rorres, C. (2013). <i>Elementary linear algebra: Applications version</i> . (11th ed.) New York, NY: Wiley. Stewart, J. (2015). <i>Calculus: Early transcendentals</i> . (8th ed.). Boston, MA: Cengage Learning. Selected readings will be available via the Moodle™ site for this unit.

Recommended readings	<p>Adams, R.A., & Essex, C. (2013). <i>Calculus: A complete course</i>. (8th ed.). New York, NY: Pearson.</p> <p>Anton, H., Bivens, I., & Davis, S. (2012). <i>Calculus: Early transcendentals</i>. (10th ed.) New York, NY: Wiley.</p> <p>Beezer, R. (2013). <i>A first course in linear algebra</i> (3rd ed.). New York, NY: Congruent press.</p> <p>Larson, R., & Edwards, B. H. (2013). <i>Calculus</i> (10th ed.). Boston, MA: Cengage Learning.</p> <p>Lippman, D. (2012). <i>Math in society</i> (2nd ed.). Retrieved from http://www.opentextbookstore.com/mathinsociety/</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) or The Holy Bible: New King James Version (NKJV).</p> <p>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.</p>
Specialist resource requirements	<p>Casio fx-82AU PLUS II scientific hand-calculator or equivalent</p>
Content	<ol style="list-style-type: none"> 1. Complex Numbers 2. Integration 3. Differential equations 4. Linear Algebra 5. Probability
Learning outcomes	<p>On completion of this unit, students will have demonstrated that they have:</p> <ol style="list-style-type: none"> 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	<p>Task 1: Folio</p> <p>Word Length/Duration: 1 each week</p> <p>Weighting: 20%</p> <p>Learning Outcomes: 1, 2, 4</p> <p>Assessed: Weekly</p> <p>Task 2: Investigation and design</p> <p>Word Length/Duration: 2 hours</p> <p>Weighting: 30%</p> <p>Learning Outcomes: 1-5</p> <p>Assessed: Week 7</p>

	<p>Task 3: Final Exam</p> <p>Word Length/Duration: 3 Hours</p> <p>Weighting: 50%</p> <p>Learning Outcomes: 1-5</p> <p>Assessed: Examination Week</p>
Unit summary	<p>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.</p>

SAMPLE