

MAST10006 Calculus 2

Credit Points:	12.50
Level:	1 (Undergraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus. Semester 2, Parkville - Taught on campus. Lectures and practice classes.
Time Commitment:	Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week. Total Time Commitment: Estimated total time commitment of 120 hours
Prerequisites:	A study score of at least 27 in VCE Specialist Mathematics 3/4, or equivalent, or one of # 620-154 Calculus 1 (/view/2010/620-154) # 620-156 Linear Algebra (/view/2010/620-156) # 620-151 Introduction to Biomedical Mathematics (prior to 2008) # 620-161 Introductory Mathematics (prior to 2008)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students may only gain credit for one of # 620-155 Calculus 2 # 620-158 Accelerated Mathematics 2 (/view/2010/620-158) # 620-113 Applied Mathematics Advanced Plus (prior to 2008) # 620-123 Applied Mathematics Advanced (prior to 2008) # 620-143 Applied Mathematics (prior to 2009) # 620-193 Applied Mathematics (prior to 2006) Students who have completed either of the following may not enrol in this subject for credit # 620-121 Mathematics A Advanced (prior to 2008) # 620-120 UMEP Maths for High Achieving Students (prior to 2008)
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Assoc Prof Craig Hodgson
Contact:	First Year Coordinator Email: fycoord@ms.unimelb.edu.au (mailto:fycoord@ms.unimelb.edu.au)
Subject Overview:	This subject will extend knowledge of calculus from school. Students are introduced to hyperbolic functions and their inverses, the complex exponential and functions of two variables. Techniques of differentiation and integration will be extended to these cases. Students will be exposed to a wider class of differential equation models, both first and second order, to describe systems such as population models, electrical circuits and mechanical oscillators. Calculus topics include: intuitive idea of limits and continuity of functions of one variable, hyperbolic functions and their inverses, level curves, partial derivatives, chain rules for partial derivatives, directional derivative, tangent planes and extrema for functions of several variables. Complex exponential topics include: definition, derivative, integral and applications. Integration

	<p>topics include: techniques of integration and double integrals. Ordinary differential equations topics include: first order (separable, linear via integrating factor) and applications, second order constant coefficient (particular solutions, complementary functions) and applications.</p>
Objectives:	<p>Students completing this subject should be able to:</p> <ul style="list-style-type: none"> # calculate simple limits of a function of one variable; # sketch and manipulate hyperbolic and inverse hyperbolic functions; # evaluate integrals using trigonometric and hyperbolic substitutions, partial fractions, integration by parts and the complex exponential; # find analytical solutions of first and second order ordinary differential equations, and use these equations to model some simple physical and biological systems; # calculate partial derivatives and gradients for functions of two variables, and use these to find maxima and minima.
Assessment:	<p>Two or three written assignments due at regular intervals during semester amounting to a total of up to 25 pages (10%), a 45-minute written test held mid-semester (15%), and a 3-hour written examination in the examination period (75%).</p>
Prescribed Texts:	<p>Calculus 1 and 2 custom published text from Pearson Education Inc. Details to be advised.</p>
Breadth Options:	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> # Bachelor of Arts (https://handbook.unimelb.edu.au/view/2010/B-ARTS) # Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2010/B-COM) # Bachelor of Environments (https://handbook.unimelb.edu.au/view/2010/B-ENVS) # Bachelor of Music (https://handbook.unimelb.edu.au/view/2010/B-MUS) <p>You should visit learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html) and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.</p>
Fees Information:	<p>Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees</p>
Generic Skills:	<p>In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future career path. These include:</p> <ul style="list-style-type: none"> # problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies; # analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis; # collaborative skills: the ability to work in a team; and # time-management skills: the ability to meet regular deadlines while balancing competing commitments.
Notes:	<p>This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BAsc or a combined BSc course.</p> <p>Students with a score of 40 or more in VCE Specialist Mathematics 3/4 are strongly encouraged to enrol in both</p> <ul style="list-style-type: none"> # 620-157 Accelerated Mathematics 1 (/view/2010/620-157) # 620-158 Accelerated Mathematics 2 (/view/2010/620-158) <p>instead of both</p> <ul style="list-style-type: none"> # 620-155 Calculus 2 # 620-156 Linear Algebra (/view/2010/620-156)
Related Course(s):	<p>Bachelor of Biomedicine Bachelor of Engineering Bachelor of Science</p>
Related Majors/Minors/Specialisations:	<p>Bioengineering Systems Civil (Engineering) Systems</p>

Physical (Environmental Engineering) Systems