

Subject Code	620-155
Title of the subject	Calculus 2
Credit points	12.5
Coordinator	Karen Baker
Semester of offer	1, repeat 2
Prerequisites	Study score of 27 or more in VCE Specialist Mathematics 3/4 or equivalent, or one of [07]620-151, 620-154, [07]620-161 or permission from the Director of the Mathematics and Statistics Learning Centre
Mode of delivery	Lectures and tutorials
Contact hours	36 one-hour lectures (three per week), 12 one-hour tutorials (one per week)
Estimated total time commitment	120 hours
Description	<p>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.</p> <p>Calculus: intuitive idea of limits, continuity and differentiability of functions of one variable, hyperbolic functions and their inverses, implicit differentiation, level curves, partial derivatives, chain rules for partial derivatives, directional derivative, tangent planes and extrema for functions of several variables. Complex exponential: definition, derivative, integral and applications. Integration: techniques of integration, arc length and double integrals. Ordinary differential equations: first order (separable, linear via integrating factor) and applications, second order constant coefficient (particular solutions, complementary functions) and applications.</p>
Assessment	Up to 25 pages of written assignments 10% (due during semester), a 45-minute written test 10% (held mid-semester), a 3-hour written examination 80% (in the examination period).
Prescribed texts	H. Anton, I. Bivens and S. Davis, <i>Calculus: Early Transcendentals</i> , 8th edition, Wiley, 2005.
Notes	Students with a score of 40 or more in Specialist Mathematics 3/4 will normally not be permitted to enrol in this subject; such students should enrol in 620-157.

	<p>Students may only gain credit for one of [07]620-113, [07]620-121, [[07]620-123, [07]620-143, 620-155, 620-158.</p>
<p>Subject objectives</p>	<p>Students completing this subject will:</p> <ul style="list-style-type: none"> • understand the intuitive idea of limits, continuity and differentiability of a function of one variable; • develop the ability to sketch and manipulate hyperbolic and inverse hyperbolic functions; • use differential calculus to solve extrema problems involving functions of several variables. • be able to evaluate integrals using trigonometric and hyperbolic substitutions, partial fractions, integration by parts and the complex exponential; • solve analytically first and second order ordinary differential equations, and use these equations to model some simple physical systems.
<p>Generic skills</p>	<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; • time-management skills: the ability to meet regular deadlines while balancing competing commitments.

