

## 620-221 Real and Complex Analysis

<b>Credit Points:</b>	12.500
<b>Level:</b>	Undergraduate
<b>Dates &amp; Locations:</b>	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus.
<b>Time Commitment:</b>	Contact Hours: 36 lectures (three per week) and 11 tutorial/practice class hours (one per week) Total Time Commitment: 120 hours
<b>Prerequisites:</b>	One of [07]620-122, [05]620-194, [07]620-211 together with one of [07]620-113 or [07]620-123; a grade of H3 or better in each of the prerequisites is recommended. Students with a grade of H1 in [08]620-142 or [05]620-192 together with a grade of H1 in [08]620-143 or [05]620-193 will be permitted to enrol on completion of additional summer reading as prescribed by the coordinator.
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	Students may only gain credit for one of 620-221 and 620-252.
<b>Core Participation Requirements:</b>	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.
<b>Coordinator:</b>	Dr J Groves
<b>Subject Overview:</b>	<p>This subject introduces the structure and methods of proof; the concept of convergence of sequences and series; basic topological concepts in the real line and complex plane; and the basic concepts of functions of a complex variable. Students completing this subject develop an ability to construct rigorous and accurate arguments; determine convergence or otherwise of sequences and series; differentiate functions of a complex variable; calculate contour integrals; and to work with analytic functions in the cut plane and apply Cauchy's integral formula and the residue theorem. The subject demonstrates the importance of rigorous arguments via proofs; the fundamental concepts of topology of the complex plane; and the differences between functions of a real and a complex variable.</p> <p>Topics include sequences of real and complex numbers and their properties; rigorous definition of the limit, Cauchy sequences; series of real or complex numbers, and absolute and conditional convergence; tests for convergence; power series of complex numbers and radius of convergence; basic topological concepts in the complex plane; continuous functions and their properties; homomorphic function and Cauchy-Riemann conditions; exponential and logarithm of the complex variable; other elementary functions; contour integration, Cauchy's theorem and Cauchy's integral formula; uniform convergence and Weierstrass M-test; equivalence of complex differentiability to the local power series expansion; Laurent series, singularities and poles; and residue theorem, evaluation of integrals and summation of series.</p>
<b>Assessment:</b>	Up to 24 pages of written assignments during the semester and a 50-minute written test held mid-semester (equally weighted, with a total of either 0% or 20%); a 3-hour written examination in the examination period (80% or 100%). The relative weighting of the examination and the total assignment plus test mark will be chosen so as to maximise the student's final mark.
<b>Prescribed Texts:</b>	None
<b>Breadth Options:</b>	This subject is a level 2 or level 3 subject and is not available to new generation degree students as a breadth option in 2008. This subject or an equivalent will be available as breadth in the future. Breadth subjects are currently being developed and these existing subject details can be used as guide to the type of options that might be available.

	2009 subjects to be offered as breadth will be finalised before re-enrolment for 2009 starts in early October.
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Notes:</b>	This subject is available for science credit to students enrolled in the BSc (pre-2008 degree only), BAsc or a combined BSc course.
<b>Related Course(s):</b>	Bachelor of Arts