

## 620-312 Linear Analysis

<b>Credit Points:</b>	12.50
<b>Level:</b>	3 (Undergraduate)
<b>Dates &amp; Locations:</b>	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus. Lectures and practice classes.
<b>Time Commitment:</b>	Contact Hours: 36 one-hour lectures (three per week) and up to 12 one-hour practice classes (one per week) Total Time Commitment: 120 hours total time commitment.
<b>Prerequisites:</b>	<i>Metric Spaces.</i>
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<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>	Assoc Prof Jerry Koliha
<b>Subject Overview:</b>	<p>The most important topic of this subject is integration. Students meet this concept in a calculus course where an integral is defined as a Riemann integral. Although a Riemann integral is useful in many areas of mathematics, it is not adequate for many problems of modern analysis. The aim of the subject is to introduce students to the Lebesgue theory of integration and measure theory. Included in this subject is an introduction to the fundamental concepts of functional analysis. Functional analysis is the common name for the study of infinite dimensional vector spaces and the linear maps between them. What distinguishes this subject from linear algebra is the role of topological considerations. These topics are not only beautiful and interesting but are also useful in other branches of mathematics such as probability theory, partial differential equations and quantum mechanics.</p> <p>Topics include construction of measures, measurable functions, Lebesgue integrals, convergence theorems, <math>L_p</math>-spaces, Fubini's theorem, normed spaces and Banach spaces, inner product and Hilbert spaces, linear functionals and linear operators.</p>
<b>Objectives:</b>	.
<b>Assessment:</b>	Up to 36 pages of written assignments due during the semester (either 0% or 20%); a 3-hour written examination in the examination period (80% or 100%). The relative weighting of the examination and the assignments will be chosen so as to maximise the student's final mark.
<b>Prescribed Texts:</b>	None
<b>Breadth Options:</b>	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> <li># <b>Bachelor of Arts</b> (<a href="https://handbook.unimelb.edu.au/view/2009/D09">https://handbook.unimelb.edu.au/view/2009/D09</a>)</li> <li># <b>Bachelor of Commerce</b> (<a href="https://handbook.unimelb.edu.au/view/2009/F04">https://handbook.unimelb.edu.au/view/2009/F04</a>)</li> <li># <b>Bachelor of Environments</b> (<a href="https://handbook.unimelb.edu.au/view/2009/A04">https://handbook.unimelb.edu.au/view/2009/A04</a>)</li> <li># <b>Bachelor of Music</b> (<a href="https://handbook.unimelb.edu.au/view/2009/M05">https://handbook.unimelb.edu.au/view/2009/M05</a>)</li> </ul>

	You should visit <b>learn more about breadth subjects</b> ( <a href="http://breadth.unimelb.edu.au/breadth/info/index.html">http://breadth.unimelb.edu.au/breadth/info/index.html</a> ) and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
<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 Majors/Minors/ Specialisations:</b>	Mathematics & Statistics Major Mathematics and Statistics (Pure Mathematics specialisation)