

## 620-156 Linear Algebra

<b>Credit Points:</b>	12.50
<b>Level:</b>	1 (Undergraduate)
<b>Dates &amp; Locations:</b>	2009, This subject commences in the following study period/s: Summer Term, - Taught on campus. Semester 1, - Taught on campus. Semester 2, - Taught on campus. Lectures, practice classes and computer laboratory classes.
<b>Time Commitment:</b>	Contact Hours: 36 one-hour lectures (three per week), 11 one-hour practice classes (one per week), 11 one-hour computer laboratory classes (one per week) Total Time Commitment: 120 hours total time commitment
<b>Prerequisites:</b>	A study score of at least 27 in VCE Specialist Mathematics 3/4, or one of # 620-151 (prior to 2008) # <i>Calculus 1</i> # 620-161 (prior to 2008) # <i>Calculus 2</i> or permission from the Director of the Mathematics and Statistics Learning Centre.
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	Students may only gain credit for one of 620-122 (prior to 2008), 620-142 (prior to 2009), <i>Linear Algebra, Accelerated Mathematics 1</i> (620-157 Mathematics 1 prior to 2009), 620-190 (UMEP Mathematics for High Achieving Students), 620-192 (prior to 2006), 620-194 (prior to 2006) or 620-211 (prior to 2008). Students in the combined degree BE/BSc should note that credit exclusions exist between this subject and some Engineering mathematics subjects.
<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 participation are encouraged to discuss this with the subject coordinator and the Disability Liaison Unit.
<b>Coordinator:</b>	Dr Lawrence Reeves
<b>Subject Overview:</b>	This subject gives a solid grounding in key areas of modern mathematics needed in science and technology. It develops the concepts of vectors, matrices and the methods of linear algebra. Students should develop the ability to use the methods of linear algebra and gain an appreciation of mathematical proof. Little of the material here has been seen at school and the level of understanding required represents an advance on previous studies.  Systems of linear equations, matrices and determinants; vectors in real n-space, cross product, scalar triple product, lines and planes; vector spaces, linear independence, basis, dimension; linear transformations, eigenvalues, eigenvectors; inner products, least squares estimation, symmetric and orthogonal matrices.
<b>Objectives:</b>	Students completing this subject should: # use matrix techniques to represent and solve a system of simultaneous linear equations; # understand the use of vectors in describing lines and planes in solid geometry; # understand the extension of vector concepts to abstract vector spaces of arbitrary finite dimension; # understand linear transformations, their matrix representations and applications;

	# become familiar with the use of a computer package for symbolic and numeric calculation.
<b>Assessment:</b>	Up to 25 pages of written assignments 10% (due during semester); two 45-minute written computer laboratory tests 10% (held during semester); a 3-hour written examination 80% (in the examination period).
<b>Prescribed Texts:</b>	Elementary Linear Algebra Applications Version (H. Anton and C. Rorres), 9th edn, Wiley, 2005.
<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> <p>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.</p>
<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>Generic Skills:</b>	<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"> <li># problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies;</li> <li># 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;</li> <li># collaborative skills: the ability to work in a team;</li> <li># time-management skills: the ability to meet regular deadlines while balancing competing commitments; and</li> <li># computer skills: the ability to use an appropriate computing package.</li> </ul>
<b>Notes:</b>	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.
<b>Related Course(s):</b>	Bachelor of Engineering Bachelor of Geomatic Engineering and Bachelor of Arts
<b>Related Majors/Minors/Specialisations:</b>	Bioengineering Systems Civil (Engineering) Systems First year mathematics and statistics Physical (Environmental Engineering) Systems