

## 436-286 Engineering Design & Materials 2

<b>Credit Points:</b>	12.50
<b>Level:</b>	2 (Undergraduate)
<b>Dates &amp; Locations:</b>	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
<b>Time Commitment:</b>	Contact Hours: Twenty-four hours of lectures and twenty-four hours of tutorials, guided design exercises and laboratory work Total Time Commitment: Not available
<b>Prerequisites:</b>	Students will be expected to be familiar with material covered in: <b>436-121</b> Introduction to Mechanical Engineering (prior to 2005, <b>436-101</b> Engineering Mechanics and Materials); (100-level mathematics - <b>620-141</b> Maths A or <b>620-121</b> Maths A (Advanced)); and <b>620-143</b> Applied Maths or <b>620-123</b> Applied Maths (Advanced) ); <b>436-202</b> Mechanics 1 and <b>436-285</b> Engineering Design and Materials 1.
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	<p>&lt;p&gt;For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry.&lt;/p&gt; <p>&lt;p&gt;It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: &lt;a href="http://services.unimelb.edu.au/disability"&gt;http://services.unimelb.edu.au/disability&lt;/a&gt;&lt;/p&gt;</p> </p>
<b>Coordinator:</b>	Mr John Gerard Weir
<b>Subject Overview:</b>	<p>Unit 1, Engineering Design: Upon completion, students should have gained practice in the skill of designing simple engineering components for structural integrity and be confident with practical work formulated in a graded progression from well delineated problems to dealing with complex and/or vaguely defined design tasks. Topics covered include failure modes for engineering systems, failure predictors for engineering components under multi-axial stress conditions; rational assessment of safety factors and maximum credible accident; integrity of structures and machines, design against failure; modeling of complex load-bearing systems in terms of simple engineering components; design of elements of structures and machines from first principles; design to resist fatigue, axial tension and compression, combined torsion, bending and internal pressure (only common metallic materials are considered); design of bolted and welded joints; and approaches to uncertainty in design problems, including those related to the environment.</p> <p>Unit 2, Engineering Materials: Upon completion, students should be able to appreciate the interrelationship between the structure, processing and properties of materials and of key factors in the selection of appropriate materials for specific applications. Topics covered include metals, ceramics, polymers, composites, corrosion and oxidation.</p>
<b>Objectives:</b>	-
<b>Assessment:</b>	Unit 1: One 2-hour end-of-semester examination (50%). Seven assignments will be completed throughout the semester not exceeding 25 pages or equivalent per student (1 at 12.5% and 6 at 6.25% each). Unit 2: One 2-hour end-of-semester examination (80%). Two laboratory reports, each up to 2500 words plus up to 10 pages of supporting material (figures and tables),

	due throughout the semester (20%). Completion and submission of satisfactory laboratory and assignments is a prerequisite for admission to the written examinations.
<b>Prescribed Texts:</b>	None
<b>Recommended Texts:</b>	Information Not Available
<b>Breadth Options:</b>	This subject is not available as a breadth subject.
<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>	<ul style="list-style-type: none"> <li># ability to apply knowledge of basic science and engineering fundamentals</li> <li># ability to communicate effectively, not only with engineers but also with the community at large</li> <li># in-depth technical competence in at least one engineering discipline</li> <li># ability to undertake problem identification, formulation and solution</li> <li># ability to utilise a systems approach to design and operational performance</li> <li># ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member</li> <li># expectation of the need to undertake lifelong learning, capacity to do so</li> <li># capacity for independent critical thought, rational inquiry and self-directed learning</li> <li># intellectual curiosity and creativity, including understanding of the philosophical and methodological bases of research activity</li> <li># openness to new ideas and unconventional critiques of received wisdom</li> </ul>
<b>Notes:</b>	Students who have passed either 436-220 Engineering Design & Materials 1 OR 436-221 Engineering Design & Materials 2, MUST NOT enrol in this subject and must seek course advice.
<b>Related Course(s):</b>	Bachelor of Engineering (Biomedical) Biomechanics Bachelor of Engineering(Mechanical & Manufacturing) and Bachelor of Laws