

# MCEN90029 Advanced Solid Mechanics

<b>Credit Points:</b>	12.50								
<b>Level:</b>	9 (Graduate/Postgraduate)								
<b>Dates &amp; Locations:</b>	2012, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.								
<b>Time Commitment:</b>	Contact Hours: 36 hours of lectures, 14 hours of tutorials and lab classes. Total Time Commitment: 120 hours								
<b>Prerequisites:</b>	<p><b>MCEN40024 Solid Mechanics</b> (<a href="http://handbook.unimelb.edu.au/view/2011/MCEN40024">../view/2011/MCEN40024</a>) (previously 436400) from 2012</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MCEN90026 Solid Mechanics</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table>			Subject	Study Period Commencement:	Credit Points:	MCEN90026 Solid Mechanics	Semester 2	12.50
Subject	Study Period Commencement:	Credit Points:							
MCEN90026 Solid Mechanics	Semester 2	12.50							
<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; &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>								
<b>Coordinator:</b>	Prof Andrew Ooi								
<b>Contact:</b>	a.ooi@unimelb.edu.au								
<b>Subject Overview:</b>	<p>This course will expand on the basic principals established previously in Solid Mechanics. Methods of three-dimensional stress and strain analysis will be extended to allow the student to obtain solutions using analytical and/or numerical methods. These will include the analyses of principal stresses and strains, three dimensional Mohr's circles, strain gauge experimentation and failure criteria. In addition, this unit will focus on plastic deformation of solids, including the analysis of residual stresses and the collapse load of structures. The responses of materials to fatigue and fracture, as well as their creep and viscoelastic behaviour, will also be explored. Finally, this unit will provide a number of examples of experimental applications of solid mechanics analysis based on modern research techniques.</p>								
<b>Objectives:</b>	<p>At the completion of this subject students should be able to -</p> <ul style="list-style-type: none"> <li>• Understand advanced stress/strain correlations</li> <li>• Demonstrate advanced understanding of the finite element method</li> <li>• Model an engineering structure without detailed instruction</li> <li>• Validate results obtained using the finite element method</li> <li>• Establish links between theoretical and practical applications; identify problems and formulate solution strategies</li> </ul>								

<b>Assessment:</b>	Two hour written exam at the end of semester (50%) and two assignments of equal weight totalling no more than 3000 words in weeks 6 and 10 (50% total).
<b>Prescribed Texts:</b>	None
<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>	On completion of this subject students should have the following skills - <ul style="list-style-type: none"> <li>• Critical thinking and critical judgement of assumptions adopted</li> <li>• Abstract mathematical reasoning</li> <li>• Interpretation and analysis of data</li> <li>• Application of theory to practice</li> </ul>
<b>Related Course(s):</b>	Bachelor of Engineering (Mechanical and Manufacturing Engineering) Bachelor of Engineering(Mechanical & Manufacturing) and Bachelor of Laws
<b>Related Majors/Minors/ Specialisations:</b>	Master of Engineering (Mechanical)