

## MCEN30001 Engineering Design & Processes 2

<b>Credit Points:</b>	12.50
<b>Level:</b>	3 (Undergraduate)
<b>Dates &amp; Locations:</b>	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. On campus only
<b>Time Commitment:</b>	Contact Hours: Thirty-one hours of lectures and case studies, 12 hours of practical work in Engineering Design and five hours of tutorials and laboratory work Total Time Commitment: 120 hours
<b>Prerequisites:</b>	<b><u>436-286 Engineering Design and Materials 2 (/view/2010/436-286)</u></b> , and <b><u>436-384 Engineering Design and Processes 1. (/view/2010/436-384)</u></b>
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: <a href="http://www.services.unimelb.edu.au/disability">http://www.services.unimelb.edu.au/disability</a>
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<b>Subject Overview:</b>	Unit 1, Engineering Design: Topics covered include general concepts of function, integrity, value, quality, efficient use of resources in the synthesis of solutions to design problems; gears and gear design; design for fatigue: characteristics of fatigue fracture, 2-D and 3-D stress conditions, cumulative damage hypothesis, Weibull distribution; design for wear: surface phenomena and tribology in design, application to bearings and seals; quantitative measures of reliability; and management of the design process: initial appreciation, information flows and networks, characteristics of manufacturing processes affecting product design.  Unit 2, Manufacturing Processes: Topics covered include principles, performance characteristics and process selection of manufacturing processes. Metals: metal forming as a system; metal forming processes including sheet metal forming, drawing forging, net shape manufacturing; process modelling; casting and moulding processes; and ceramics and powder metallurgy: pressing, plastic forming, injection moulding and casting; drying and firing.
<b>Objectives:</b>	Unit 1: Upon completion of this unit, students should have gained -

	<ul style="list-style-type: none"> <li># An appreciation of methods for synthesising solutions to open-ended design problems at an intermediate level of complexity in mechanical and manufacturing engineering;</li> <li># A deep understanding of the concepts and methods of designing for system and component integrity under conditions of fatigue and wear;</li> <li># And a deep understanding of information-based techniques for the management of engineering design.</li> </ul> <p>Unit 2: Upon completion of this unit, students should understand -</p> <ul style="list-style-type: none"> <li># The basic principles, objectives and performance characteristics of some major methods of shaping components;</li> <li># The variables affecting the performance of the various processes and the process capabilities;</li> <li># And be able to predict main forming parameters, such as loads, pressures and work of deformation for simple deformation.</li> </ul>
<b>Assessment:</b>	Assessment includes: Two 2-hour end-of-semester examinations (55%); Tests, continuous assessment throughout the semester of group and individual projects, assignments and laboratory reports not exceeding 16000 words (40 pages excluding computations, tables, graphs, diagrams) (45%). All components of assessment must be satisfactorily completed to pass the subject.
<b>Prescribed Texts:</b>	None
<b>Recommended Texts:</b>	Unit-1 - G. Budynas and J.K. Nisbett "Shigley's Mechanical Engineering Design" (2008)
<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># Advanced integrated mechanism design and failure prediction</li> <li># Middle-term, team-based project work</li> </ul>
<b>Related Course(s):</b>	Bachelor of Engineering (Engineering Management) Mechanical & Manufacturing Bachelor of Engineering (Mechanical & Manufacturing) and Bachelor of Arts Bachelor of Engineering (Mechanical & Manufacturing) / Bachelor of Commerce Bachelor of Engineering (Mechanical and Manufacturing Engineering) Bachelor of Engineering (Mechatronics) and Bachelor of Computer Science Bachelor of Engineering (Mechanical & Manufacturing) and Bachelor of Laws