

MCEN90013 Design and Manufacturing 2

Credit Points:	12.50								
Level:	9 (Graduate/Postgraduate)								
Dates & Locations:	2011, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.								
Time Commitment:	Contact Hours: 36 hours lectures, 12 hours of supervised practice in engineering design and 5 hours tutorials Total Time Commitment: 120 hours								
Prerequisites:	Prerequisite for this subject is -								
	<table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MCEN90012 Design and Manufacturing 1</td> <td>Semester 1</td> <td>12.50</td> </tr> </tbody> </table>			Subject	Study Period Commencement:	Credit Points:	MCEN90012 Design and Manufacturing 1	Semester 1	12.50
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MCEN90012 Design and Manufacturing 1	Semester 1	12.50							
Corequisites:	N/A								
Recommended Background Knowledge:	N/A								
Non Allowed Subjects:	N/A								
Core Participation Requirements:	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: http://www.services.unimelb.edu.au/disability/								
Coordinator:	Dr Colin Burvill								
Contact:	colb@unimelb.edu.au (mailto:colb@unimelb.edu.au)								
Subject Overview:	<p>As a result of satisfactorily participating in this subject, students should be able to undertake design tasks at an intermediate level, considering performance under uncertain system integrity due to fatigue and wear, and have the ability to design or select suitable ameliorating solutions. Students also will be able to modify manufacturing systems to improve their performance. Students will have the ability to design or select suitable productive systems that are used in companies.</p> <p>Topics covered in this subject may include: general concepts of function, integrity, value, quality, efficient use of resources in the synthesis of solutions to design problems; specific mechanical elements such as gears and other common means of power transmission, and their design; materials requirements planning; organising for flexible manufacturing; lean manufacturing, and Toyota Production System; quality systems, including six-sigma; automated flow lines; development of understanding, in the engineering paradigm, of general concepts such as: function, integrity, value, quality, the efficient use of resources in the synthesis of solutions to design problems.</p> <p>Students will also be exposed to:</p> <p>Design for fatigue: characteristics of fatigue fracture, two-dimensional (2-D) and three-dimensional (3-D) stress conditions;</p> <p>Management of the design process: initial appreciation, information flows and networks, characteristics of manufacturing processes affecting product design;</p> <p>Cumulative damage hypothesis;</p> <p>The Weibull distribution;</p> <p>Design for wear: surface phenomena and tribology; its application to bearings and seals;</p> <p>Quantitative measures of reliability;</p> <p>Forensic case studies of failed engineered designs.</p>								
Objectives:	On completion of this subject students should be able to:								

	<ul style="list-style-type: none"> • provide in-depth explanation of and apply the concepts and methods of designing for system and component integrity under conditions of fatigue and wear; • apply information-based techniques for the management of engineering design; • list , explain, evaluate and modify the function of the major components of manufacturing systems and how they interact with engineering design and clients; • analyse the efficiency of some basic productive systems; • describe in detail information-based techniques for the management of engineering design.
Assessment:	Two 2-hour end-of-semester examinations (60%).Two group projects, not exceeding 3,000 words (excluding computations, tables, graphs, diagrams) per student (25%). The final reports for these projects will be due mid-way through semester and towards the end of semester.One assignment not exceeding 2,000 words (excluding computations, tables, graphs, diagrams) per student (10%) due in week 10 of the semester, one 50 minute mid-semester test (5%).Students must obtain a mark of at least 40% for all continuing assessment tasks in order to pass the subject.
Prescribed Texts:	Deiter, G.E. and Schmidt, L.C., "Engineering Design", 4th Edition, McGraw-Hill, 2009 (to be confirmed closer to the introduction date)Groover, M.K., Fundamentals of Modern Manufacturing – materials, processes and systems, 3rd edition, Wiley (to be confirmed)
Recommended Texts:	N/A
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	<ul style="list-style-type: none"> # Ability to undertake problem identification, formulation, and solution # Ability to utilise a systems approach to complex problems and to design and operational performance # Proficiency in engineering design # Ability to conduct an engineering project # Ability to communicate effectively, with the engineering team and with the community at large # Ability to manage information and documentation # Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member
Related Course(s):	Bachelor of Engineering (Mechanical &Manufacturing)/Bachelor of Commerce
Related Majors/Minors/Specialisations:	B-ENG Mechanical Engineering stream Master of Engineering (Mechanical)