

MCEN90024 Mechatronics Design

Credit Points:	12.50																				
Level:	9 (Graduate/Postgraduate)																				
Dates & Locations:	This subject is not offered in 2014.																				
Time Commitment:	Contact Hours: 24 hours of lectures and 24 hours of tutorials, guided design exercises and lab work. Total Time Commitment: 200 hours																				
Prerequisites:	<table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>ELEN20005 Foundations of Electrical Networks</td> <td>January, Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>Plus</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MCEN30016 Mechanical Dynamics</td> <td>Semester 1</td> <td>12.50</td> </tr> </tbody> </table> <p>OR</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>ELEN30012 Signals and Systems</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table>			Subject	Study Period Commencement:	Credit Points:	ELEN20005 Foundations of Electrical Networks	January, Semester 2	12.50	Subject	Study Period Commencement:	Credit Points:	MCEN30016 Mechanical Dynamics	Semester 1	12.50	Subject	Study Period Commencement:	Credit Points:	ELEN30012 Signals and Systems	Semester 2	12.50
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Corequisites:	None																				
Recommended Background Knowledge:	None																				
Non Allowed Subjects:	None																				
Core Participation Requirements:	<p>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/</p>																				
Contact:	<p>doetomo@unimelb.edu.au (https://mce_host/faces/htdocs/mail) to:doetomo@unimelb.edu.au)</p>																				
Subject Overview:	<p>AIMS</p> <p>Mechatronics Design aims to provide the students with the knowledge, skills, and exposure to the integrated design process of mechatronics systems. It provides the appreciation of the components of mechatronics systems, such as sensors and actuators, the fundamental principal of these components, their strengths and weaknesses, and its operational characteristics. This leads into the design process of integrated iterative design, division a system into sub-systems, component selection and sizing, and the inclusion of various considerations into a quantifiably justified design. The subject also provides wider background knowledge of Mechatronics, exposing the students to the current state-of-the-arts and challenges. Design exercises with increasing degrees of complexity will form the continuous assessment in this subject to put the material covered in the lecture into practice.</p> <p>This subject has been integrated with the Skills Towards Employment Program (STEP) and contains activities that can assist in the completion of the Engineering Practice Hurdle (EPH).</p> <p>INDICATIVE CONTENT</p>																				

	<p>Topics covered include –</p> <ul style="list-style-type: none"> # Mechatronics design concepts: <ul style="list-style-type: none"> # integrative design concepts # analogies between electrical and mechanical systems # appreciation of components of mechatronics systems # component selection and sizing # design exercise and justifications. # Mechatronic system modelling and simulation methods <ul style="list-style-type: none"> # stochastic discrete event system modelling # hardware description languages for design # hardware-in-the-loop methods # hardware-software co-designs # Mechatronic system design: <ul style="list-style-type: none"> # optimal division into sub systems, # prototype development, # appraisal of benefit and cost # Evolution of mechatronics design and challenges # Case studies
<p>Learning Outcomes:</p>	<p>INTENDED LEARNING OUTCOMES (ILO)</p> <p>Having completed this subject the student is expected to be able to -</p> <ol style="list-style-type: none"> 1 - Evaluate and compare diverse methods of engineering design in constituent disciplines of mechatronics to appreciate their usage in mechatronic product design 2 - Apply systems engineering perspective in designing mechatronic systems 3 - Demonstrate hands-on experience in applying mechatronics design
<p>Assessment:</p>	<p>One two-hour end-of-semester examination (50%). Associated with Intended Learning Outcome (ILO) 1 A series of assignments (projects and labs), completed throughout the semester not exceeding 5000 words or equivalent per student (50% total). Students must obtain a mark of at least 40% for all continuing assessment tasks in order to pass the subject. Associated with ILOs 2 and 3.</p>
<p>Prescribed Texts:</p>	<p>None</p>
<p>Breadth Options:</p>	<p>This subject is not available as a breadth subject.</p>
<p>Fees Information:</p>	<p>Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees</p>
<p>Generic Skills:</p>	<ul style="list-style-type: none"> • Ability to utilise a systems approach to complex problems and to design and operational performance • Proficiency in engineering design • Capacity for creativity and innovation • 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
<p>Notes:</p>	<p>LEARNING AND TEACHING METHODS</p> <p>The subject will be delivered through a combination of lectures and workshops. Practical design exercises that require students to select commercially available components will be carried out in the workshops. Students will complete 3 design exercises as assignments to reinforce the material covered in lectures.</p>
<p>Related Majors/Minors/ Specialisations:</p>	<p>Master of Engineering (Mechatronics)</p>