# MCEN90024 Mechatronics Design

| | |
|---|---|
| **Credit Points:** | 12.50 |
| **Level:** | 9 (Graduate/Postgraduate) |
| **Dates & Locations:** | 2011, Parkville<br>This subject commences in the following study period/s:<br>Semester 2, Parkville - Taught on campus. |
| **Time Commitment:** | Contact Hours: 24 hours of lectures and 24 hours of tutorials, guided design exercises and lab work. Total Time Commitment: 120 hours |
| **Prerequisites:** | Prerequisite is - |

| Subject | Study Period Commencement: | Credit Points: |
|---|---|---|
| MCEN30017 Mechanics & Materials | Semester 1 | 12.50 |

| | |
|---|---|
| **Corequisites:** | N/A |
| **Recommended Background Knowledge:** | N/A |
| **Non Allowed Subjects:** | 436285 Design and Materials 1<br>436286 Design and Materials 2 |
| **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:** | **burvill@unimelb.edu.au (mailto:burvill@unimelb.edu.au)** |
| **Subject Overview:** | Topics covered include Mechatronics design concepts, Modelling and Simulation Methods, Mechatronic System Design, Evolution of Mechatronics Design and Case Studies<br>• Mechatronics design concepts: Integrative design concepts, analogies between electrical and mechanical systems, Analog/Digital Transducers ;<br>• Mechatronic System modeling and simulation methods: Stochastic Discrete Event System Modelling using Automata, Hardware Description Languages for design, Hardware-in-the-loop methods, Hardware-Software co-designs;<br>• Mechatronic system design: Optimal division in to sub systems, Prototype development, Market considerations and E-commerce compatibility, appraisal of benefit and cost;<br>• Evolution of Mechatronics Design: Concepts of MEMS and Nanotechnology and design challenges<br>• Case Studies: Various case studies and hands-on lab modules |
| **Objectives:** | At the conclusion of this subject students should be able to:<br>• Evaluate and compare diverse methods of engineering design in constituent disciplines of Mechtronics to appreciate their usage in Mechatronic product design<br>• Apply systems engineering perspective in designing mechatronic systems<br>• Investigate further evolvement of Mechatronics in new directions with the advancement of constituent technologies<br>• Demonstrate hands-on experience in applying mechatronics design |
| **Assessment:** | • Ability to apply knowledge of science and engineering fundamentals• Ability to undertake problem identification, formulation, and solutionOne two-hour end-of-semester examination (50%). A series of assignments (projects and labs), completed throughout the semester not exceeding 5000 words or equivalent per student (30% total). A series 5-6 quizzes and tutorial |

| | |
|---|---|
| | problems to be completed within design laboratory sessions (equal weight, 20% total), equally spread throughout the semester. Students must obtain a mark of at least 40% for all continuing assessment tasks in order to pass the subject. |
| **Prescribed 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:** | • Ability to utilise a systems approach to complex problems and to design and operational performance<br>• Proficiency in engineering design<br>• Capacity for creativity and innovation<br>• 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 Majors/Minors/ Specialisations:** | Master of Engineering (Mechatronics) |