

## Master of Engineering (Mechatronics)

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| <b>Year and Campus:</b>                    | 2012   |
| <b>Coordinator:</b>                        | Dr Chris Manzie  |
| <b>Contact:</b>                            | <p>Melbourne School of Engineering<br/>Ground floor, Old Engineering, Building 173</p> <p>Current students:<br/>Email <a href="mailto:13MELB@unimelb.edu.au">13MELB@unimelb.edu.au</a> (mailto:13MELB@unimelb.edu.au)<br/>Phone 13MELB (13 6352)<br/>+61 3 9035 3511</p> <p>Prospective students:<br/>Email: <a href="mailto:eng-info@unimelb.edu.au">eng-info@unimelb.edu.au</a> (mailto:eng-info@unimelb.edu.au)<br/>Phone +61 3 8344 6944</p>   |
| <b>Overview:</b>                           | <p>Mechatronics engineering blends the disciplines of mechanical, electrical and software engineering around the principles of control systems and automation. Mechatronic engineers create and work with systems that have various degrees of automation, which is increasingly a factor of everyday life with examples including robots, automobiles and CNC machines all featuring levels of computer control.</p> <p>Objectives:</p>   |
| <b>Objectives:</b>                         | <p>This course has as its objectives that graduates should -</p> <ul style="list-style-type: none"> <li># Have a sound fundamental understanding of the scientific principles underlying technology</li> <li># Have acquired the educational and professional standards of the professional institutions and boards with which the School's courses are accredited</li> <li># Possess a broad knowledge base of their chosen discipline, and of other disciplines so as to facilitate effective communication with those other professionals with whom engineers routinely communicate</li> <li># Understand the basic principles underlying the management of physical, human and financial resources</li> <li># Have acquired the mathematical and computational skills necessary for the solution of theoretical and practical problems for further professional development and for meeting future changes in technology</li> <li># Possess analytical, problem-solving and, where relevant, design skills, including those appropriate for sustainable development</li> <li># Have verbal and written communication skills that enable them to make a meaningful contribution to the changes facing our society</li> <li># Have developed professional ethics and responsibility towards the profession and the community</li> <li># Have an appreciation of the interpersonal and management skills required by engineers in undertaking professional activities and</li> <li># Understand the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development</li> </ul> |
| <b>Structure &amp; Available Subjects:</b> | <p>The Master of Engineering (Mechatronics) consists of 300 points of study - 287.5 points core and 12.5 points elective subjects as detailed below.</p> <p>Advanced standing will be awarded for equivalent subjects taken in prior study to applicants on the following basis:</p> <ul style="list-style-type: none"> <li># a maximum of 100 points for applicants with a 4 year Bachelor of Engineering or equivalent.</li> <li># a maximum of 100 points for applicants with a 3 year undergraduate degree. Students entering with a three year bachelor degree must complete at least 200 points of study within the Masters of Engineering. In cases where applicants have completed the equivalent of more than 100 points of core masters subjects, discipline specific electives must be taken to fulfill the 200 minimum masters study requirement.</li> </ul> <p>Note: applicants from the University of Melbourne with:</p> <ul style="list-style-type: none"> <li># An appropriate "Engineering System" major will receive 100 points of advanced standing. Applicants who have completed more than 100 points of core subjects in their</li> </ul>   |

undergraduate degree will obtain exemption for the cores taken but will need to replace the points in excess of 100 points with elective subjects.

**Subject Options:**

Total 300 points - 287.5 points core (compulsory) and 12.5 points elective subjects from the lists below. Students must complete all 300 points of subjects, including all core subjects, or have advanced standing or exemption.

The core and elective subjects are those listed below. The order of subjects below is one way of progressing through the course - students who meet subject requisites may tailor their individual study plan to take into account advanced standing and their preferred study load. Students plan their study on-line, however Melbourne School of Engineering course advisors are available to assist students with individual study plans.

Students who enter without advanced standing for Engineering Mechanics should commence in Summer Semester or in Semester 2 to assist with course planning.

**Suggested first 100 points:**

Suggested study plan for the first 100 points:

# 100 points Core

Core (Total 100 points)

| Subject                                      | Study Period Commencement:          | Credit Points: |
|--|-------------------------------------|----------------|
| MAST20029 Engineering Mathematics            | Summer Term, Semester 1, Semester 2 | 12.50          |
| ENGR20004 Engineering Mechanics              | January, Semester 1, Semester 2     | 12.50          |
| ELEN20005 Foundations of Electrical Networks | January, Semester 2                 | 12.50          |
| ENGR90021 Engineering Communication          | Semester 1, Semester 2              | 12.50          |
| COMP20005 Engineering Computation            | Semester 1, Semester 2              | 12.50          |
| ENGR30001 Fluid Mechanics & Thermodynamics   | Semester 1, Semester 2              | 12.50          |
| MCEN30017 Mechanics & Materials              | Semester 1                          | 12.50          |
| MCEN30016 Mechanical Dynamics                | Semester 1                          | 12.50          |

**Suggested second 100 points:**

Suggested study plan for the second 100 points:

# 100 points Core

Core (Total 100 points)

| Subject  | Study Period Commencement: | Credit Points: |
|--|----------------------------|----------------|
| ELEN90055 Control Systems                        | Semester 1                 | 12.50          |
| ELEN30009 Electrical Network Analysis and Design | Semester 1                 | 12.50          |
| ELEN30010 Digital System Design                  | Semester 1                 | 12.50          |
| MCEN90024 Mechatronics Design                    | Semester 2                 | 12.50          |
| COMP90041 Programming and Software Development   | Semester 1, Semester 2     | 12.50          |
| ELEN90064 Advanced Control Systems               | Semester 2                 | 12.50          |
| MCEN90009 Dynamics of Machines                   | Semester 2                 | 12.50          |

|   |            |       |
|---|------------|-------|
| SWEN30006 Software Modelling and Design | Semester 1 | 12.50 |
|---|------------|-------|

**Suggested third 100 points:**

Suggested study plan for the third 100 points:

- # 87.5 points Core
- # 12.5 points Mechatronics Elective from the list below

Core (Total 87.5 points)

| Subject                             | Study Period Commencement:        | Credit Points: |
|-------------------------------------|-----------------------------------|----------------|
| MCEN90022 Capstone Project          | Year Long, Semester 1, Semester 2 | 25             |
| MCEN90011 Manufacturing Systems     | Semester 1                        | 12.50          |
| MCEN90017 Advanced Motion Control   | Semester 2                        | 12.50          |
| COMP90038 Algorithms and Complexity | Semester 1, Semester 2            | 12.50          |
| MCEN90015 Thermodynamics            | Semester 1                        | 12.50          |
| ELEN90066 Embedded System Design    | Semester 2                        | 12.50          |

**Mechatronics Electives**

Total 12.5 points

900 level technical subjects from Electrical Engineering, Mechanical Engineering or Melbourne School of Information may be considered as electives.

| Subject  | Study Period Commencement: | Credit Points: |
|--|----------------------------|----------------|
| MCEN90026 Solid Mechanics                        | Semester 2                 | 12.50          |
| MCEN90028 Automation Systems                     | Semester 2                 | 12.50          |
| MCEN90027 Simulation Of Mechatronic Systems      | Not offered 2012           | 12.50          |
| MCEN90031 Applied High Performance Computing     | Semester 2                 | 12.50          |
| SWEN30006 Software Modelling and Design          | Semester 1                 | 12.50          |
| ENGR90024 Computational Fluid Dynamics           | Semester 1                 | 12.50          |
| COMP30017 Operating Systems and Network Services | Semester 1                 | 12.50          |
| MCEN90023 Quality and Reliability                | Semester 2                 | 12.50          |
| MCEN90032 Sensor Systems                         | Semester 1                 | 12.50          |

**Links to further information:**

[http://www.eng.unimelb.edu.au/Postgrad/MEng/me\\_mechatronics.html](http://www.eng.unimelb.edu.au/Postgrad/MEng/me_mechatronics.html)

**Related Course(s):**

Master of Engineering