

## MC-ENG Master of Engineering

<b>Year and Campus:</b>	2014 - Parkville
<b>CRICOS Code:</b>	069275C
<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>Level:</b>	Graduate/Postgraduate
<b>Duration &amp; Credit Points:</b>	300 credit points taken over 36 months full time. This course is available as full or part time.
<b>Coordinator:</b>	Professor Andrew Ooi Email: <a href="mailto:a.ooi@unimelb.edu.au">a.ooi@unimelb.edu.au</a>
<b>Contact:</b>	<p>Melbourne School of Engineering Ground Floor, Old Engineering (Building 173)</p> <p>Current students: Email: <a href="mailto:13MELB@unimelb.edu.au">13MELB@unimelb.edu.au</a> (<a href="mailto:13MELB@unimelb.edu.au">mailto:13MELB@unimelb.edu.au</a>) Phone: 13MELB (13 6352) +61 3 9035 5511</p> <p>Prospective students: Visit <b>Master of Engineering</b> (<a href="http://www.eng.unimelb.edu.au/study/graduate/">http://www.eng.unimelb.edu.au/study/graduate/</a>)</p>
<b>Course Overview:</b>	<p>The professional Master of Engineering is a three-year full time program consisting of 300 credit points (may also be taken part-time), offered in sixteen specialisations: Biomedical, Biochemical, Chemical, Chemical with Business, Civil, Civil with Business, Electrical, Electrical with Business, Environmental, Geomatics, Mechanical, Mechanical with Business, Mechatronics, Software, Software with Business and Structural. Students can enter the Master of Engineering via a number of pathways:</p> <ul style="list-style-type: none"> <li># Based on prior study of (suitable) Mathematics and (suitable) Science subjects at the first-year university level, plus a completed undergraduate degree</li> <li># Based on the prior completion of a designated "Engineering Systems" major in the New Generation/Melbourne Model Bachelor of Biomedicine, Bachelor of Environments, Bachelor of Science</li> <li># Based on prior completion of a designated sequence of Breadth subjects in the New Generation/Melbourne Model Bachelor of Commerce</li> <li># Based on an undergraduate Bachelor of Engineering or equivalent</li> </ul> <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 fulfil the 200 point 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 undergraduate degree will obtain exemption for the cores taken but will need to replace the points in excess of 100 points with specialisation specific electives.</li> <li># Engineering breadth sequences (including those in the Bachelor of Commerce) will receive advance standing to a maximum of 100 points.</li> </ul> <p><b>Distinction</b></p> <p>Upon completion of the Master of Engineering, it is possible for a student to be awarded Master of Engineering with Distinction provided a student has achieved a high level of academic performance. Eligibility of the Distinction award is dependent on a calculated distinction score.</p> <p>The distinction score will only take into account level 9 subjects undertaken at the University of Melbourne. This means Study Abroad and Exchange subjects will not be considered. One 12.5 point subject with the lowest mark will be omitted in the calculation of the distinction score. All level 9 subjects with credit points of more than 12.5 points must be included in the calculations.</p>

	<p>Only marks from the first attempt at a subject will be used. The average mark will be weighted by the credit points of the subjects. A Master of Engineering with Distinction will be awarded if the score is 80 or above.</p> <p><b>Engineering Practice Hurdle Requirement</b></p> <p>Students enrolled in the masters will need to satisfy the requirements of the Engineering Practice hurdle prior to being awarded the degree.</p> <p>Students will be introduced early in their degree to the on-line e-portfolio system as a way of documenting their attainment of graduate attributes which accord with university and professional accreditation standards. Students will keep a record of their stepwise attainment of these capabilities throughout their engineering studies at Melbourne. The artifacts recorded in the e-portfolio will include formal study elements, such as design reports, as well as reflections on extracurricular activities such as employment and volunteering activities. The final output for this hurdle will be to produce portfolios for two jobs that place emphasis on different attributes.</p> <p><b>Hurdle Objectives</b></p> <p>At the completion of the hurdle students should be able to:</p> <ul style="list-style-type: none"> <li># Analyse job advertisements and selection criteria to identify the graduate attributes an employer is seeking</li> <li># Compare evidence of their attribute acquisition with those sought by employers</li> <li># Plan the further development of their attributes to meet career goals</li> <li># Prepare a portfolio of evidence of acquisition of attributes that meet a particular employers needs.</li> </ul> <p><b>Hurdle Requirement</b></p> <p>Preparation and submission of two portfolios totalling 2000 words, submitted via the e-portfolio system, in the final semester of the degree to the satisfaction of the course co-ordinator. Completion of the degree will not be approved until this requirement has been met.</p>
<p><b>Learning Outcomes:</b></p>	<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>
<p><b>Course Structure &amp; Available Subjects:</b></p>	<p>The Master of Engineering consists of 300 points of study, typically across six semesters. This includes:</p> <ul style="list-style-type: none"> <li># 100 points of foundation study tailored to individual students who enter from non-Engineering backgrounds; and</li> <li># 200 points, including at least one 25-point project completed in the final year of study, of mainly engineering discipline specific study at the level of depth required to practice as a professional engineer upon graduation.</li> </ul> <p>See each specialisation for the core (compulsory) and elective subject requirements.</p>

<b>Majors/Minors/ Specialisations</b>	<p align="center"><b>Specialisations within the Master of Engineering</b></p> <table border="1"> <thead> <tr> <th align="left">Major/Minor/Specialisation</th> </tr> </thead> <tbody> <tr><td>Master of Engineering (Biochemical)</td></tr> <tr><td>Master of Engineering (Biomedical)</td></tr> <tr><td>Master of Engineering (Chemical)</td></tr> <tr><td>Master of Engineering (Chemical with Business)</td></tr> <tr><td>Master of Engineering (Civil)</td></tr> <tr><td>Master of Engineering (Civil with Business)</td></tr> <tr><td>Master of Engineering (Electrical)</td></tr> <tr><td>Master of Engineering (Electrical with Business)</td></tr> <tr><td>Master of Engineering (Environmental)</td></tr> <tr><td>Master of Engineering (Geomatics)</td></tr> <tr><td>Master of Engineering (Mechanical)</td></tr> <tr><td>Master of Engineering (Mechanical with Business)</td></tr> <tr><td>Master of Engineering (Mechatronics)</td></tr> <tr><td>Master of Engineering (Software)</td></tr> <tr><td>Master of Engineering (Software with Business)</td></tr> <tr><td>Master of Engineering (Structural)</td></tr> </tbody> </table>	Major/Minor/Specialisation	Master of Engineering (Biochemical)	Master of Engineering (Biomedical)	Master of Engineering (Chemical)	Master of Engineering (Chemical with Business)	Master of Engineering (Civil)	Master of Engineering (Civil with Business)	Master of Engineering (Electrical)	Master of Engineering (Electrical with Business)	Master of Engineering (Environmental)	Master of Engineering (Geomatics)	Master of Engineering (Mechanical)	Master of Engineering (Mechanical with Business)	Master of Engineering (Mechatronics)	Master of Engineering (Software)	Master of Engineering (Software with Business)	Master of Engineering (Structural)
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<b>Entry Requirements:</b>	<p>1. The Selection Committee will evaluate the applicant's ability to pursue successfully the course using the following criteria:</p> <ul style="list-style-type: none"> <li># An undergraduate degree with an average grade of H3 (65%) or more in the final two years.</li> <li># University of Melbourne graduates will have average grades computed following any policy for the computation of average grades or grade-point averages that the Academic Board prescribes.</li> <li># Completion of at least 25 points of relevant tertiary-level Mathematics* and at least 25 points of relevant tertiary-level Science as specified below.**</li> </ul> <p>2. The Selection Committee may conduct interviews and tests and may call for referee reports or employer references to elucidate any of the matters referred to above.</p> <p><b>*Relevant tertiary mathematics prerequisites for Master of Engineering Streams</b></p> <p>For the Master of Engineering (Geomatics) and Master of Engineering (Software) streams, any first year mathematics subjects that assume prior knowledge of VCE Mathematical Methods 3/4 or equivalent may be counted towards the required 25 points of mathematics. For all other streams, a more prescriptive requirement applies: the 25 points of mathematics must include both linear algebra and calculus at an appropriate level.</p> <p>Note. The 2011 Handbook University of Melbourne subjects MAST10007 Linear Algebra (previously 620-156) and MAST10006 Calculus 2 (previously 620-155) are considered to be linear algebra and calculus at an appropriate level.</p> <p><b>**Relevant tertiary science prerequisites for Master of Engineering Streams</b></p> <p>In addition to the tertiary mathematics prerequisites, the following science prerequisites apply to specific streams.</p> <p><i>Master of Engineering (ME) (Biomedical)</i> Either 25 points of first year Biology or 25 points of first year Chemistry (or equivalent).</p> <p><i>Master of Engineering (ME) (Biochemical)</i></p>																	

25 points of first year Chemistry (or equivalent).

*Master of Engineering (ME) (Chemical) and (Chemical with Business)*  
25 points of first year Chemistry (or equivalent).

*Master of Engineering (ME) (Civil) and (Civil with Business)*  
25 points of first year Science (any).

*Master of Engineering (ME) (Electrical) and (Electrical with Business)*  
25 points of first year Physics (or equivalent).

*Master of Engineering (ME) (Environmental)*  
25 points of first year Science (any).

*Master of Engineering (ME) (Geomatics)*  
25 points of Science (a broad interpretation of the Sciences which may include geography, psychology, environments subjects and archaeology or other equivalent subjects).

*Master of Engineering (ME) (Mechanical) and (Mechanical with Business)*  
25 points of first year Physics (or equivalent).

*Master of Engineering (ME) (Mechatronics)*  
25 points of first year Physics (or equivalent).

*Master of Engineering (ME) (Software) and (Software with Business)*  
25 points of first year computing, computer science, or programming (or equivalent).

*Master of Engineering (ME) (Structural)*  
25 points of first year Science (any).

#### **Available credit**

Up to 100 points of credit may be granted to students admitted to the Master of Engineering with appropriate prior studies in relevant disciplines:

- 1 Graduates of Melbourne Model undergraduate degrees who complete one of a set of prescribed Engineering Systems majors will receive 100 points of credit.
- 2 Graduates of the Melbourne Model Bachelor of Commerce who complete a prescribed sequence of subjects including specified Engineering and Engineering-relevant subjects will receive either 50 or 100 points of credit, depending on the stream of the Master of Engineering chosen.
- 3 Available credit for other University of Melbourne graduates and graduates of other universities is normally evaluated on a case by case basis, but the Academic Board may approve standard credit arrangements for specified entry pathways.

#### **English Requirement**

All students studying at the University of Melbourne must satisfy the University's English language entry requirements in accordance with Selection Principles: Regulation 11.1.A2 – Admission and Selection to Courses.

<http://futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements> (<http://futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements>)

For graduate students the University's English language entry requirements are set out at:

<http://futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements/graduate-toefl-ielts> (<http://futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements/graduate-toefl-ielts>)

#### **The University of Melbourne English Language Bridging Program (UMELBP)**

The UMELBP provides a direct English language pathway from Hawthorn-Melbourne to specific courses at the University of Melbourne. Students who have achieved an IELTS band 0.5 lower than their University of Melbourne course entry requirement may be able to proceed directly to their University studies upon successful completion of the UMELBP. More information is available from the Hawthorn Melbourne website.

<http://www.hawthornenglish.com/> (<http://www.hawthornenglish.com/>)

The Melbourne School of Engineering's English Language alternative may affect the duration and cost of your course

<http://www.eng.unimelb.edu.au/study/english-requirements.html> (<http://www.eng.unimelb.edu.au/study/english-requirements.html>)

#### **Core Participation Requirements:**

The Master of Engineering welcomes applications from students with disabilities. It is University and degree policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the degree. The Master of Engineering requires all students to enrol in subjects where they will require: the ability to comprehend complex science, technology and engineering related

	<p>information; the ability to clearly and independently communicate a knowledge and application of science, technology and engineering principles and practices during assessment tasks; and in some areas of study, the ability to actively and safely contribute in clinical, laboratory, and fieldwork/excursion activities. Students must possess behavioural and social attributes that enable them to participate in a complex learning environment. Students are required to take responsibility for their own participation and learning. They also contribute to the learning of other students in collaborative learning environments, demonstrating interpersonal skills and an understanding of the needs of other students. Assessment may include the outcomes of tasks completed in collaboration with other students. There are additional inherent academic requirements for some subjects, and these requirements are listed within the description of the requirements for each of these subjects. Students who feel their disability will impact on meeting this requirement are encouraged to discuss this matter with the relevant Subject Coordinator and the Disability Liaison Unit: <a href="http://www.services.unimelb.edu.au/disability/">http://www.services.unimelb.edu.au/disability/</a></p>
<p><b>Further Study:</b></p>	<p>Completion of the Master of Engineering can be used as the basis to apply for entry to research Masters or PhD programs.</p> <p>Students who complete the Master of Engineering with an overall mark of 75% (H2A), or above, will have met the entrance requirements in relation to: minimum qualifications, academic achievement and evidence of research ability.</p> <p>Note: All Master of Engineering specialisations include a 25-or-more credit point research or design project, or both, and the Master of Engineering is deemed to be a suitable research-preparation degree.</p> <p>Students who complete the Master of Engineering will have met the University's English language entry requirements for PhD admission. All other criteria for selection into the University's PhD program will equally be satisfied.</p>
<p><b>Graduate Attributes:</b></p>	<p>Engineers Australia Elements of Competency</p> <p>1.1 Knowledge of science and engineering fundamentals 1.2 In-depth technical competence in at least one engineering discipline 1.3 Techniques and resources 1.4 General knowledge 2.1 Ability to undertake problem identification, formulation and solution 2.2 Understanding of social, cultural, global and environmental responsibilities and the need to employ principles of sustainable development 2.3 Ability to utilise a systems approach to complex problems and to design design and operational performance 2.4 Proficiency in engineering design 2.5 Ability to conduct an engineering project 2.6 Understanding of the business environment 3.1 Ability to communicate effectively, with the engineering team and the community at large 3.2 Ability to manage information and documentation 3.3 Capacity for creativity and innovation 3.4 Understanding of professional and ethical responsibilities and committed to them 3.5 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 3.6 Capacity for lifelong learning and professional development 3.7 Professional attitudes</p> <p>Engineering Faculty Graduate Attributes</p> <p>Strong analytical skills Depth of understanding Practical ingenuity creativity Understanding of global issues Communication Business and management Creativity Leadership Lifelong learners High ethical standards and professionalism</p> <p>University of Melbourne Graduate Attributes</p> <p>Academically excellent Knowledgeable across disciplines Attuned to cultural diversity Active global citizens Leaders in communities</p>
<p><b>Professional Accreditation:</b></p>	<p><b>Engineers Australia</b></p> <p>Full accreditation awarded to the Biomedical, Biochemical, Chemical, Civil, Electrical, Environmental, Mechanical, Mechatronics, Software and Structural specialisations. Provisional accreditation has been awarded to the Geomatics specialisation. Accreditation for the Chemical with Business, Civil with Business, Electrical with Business, Mechanical with Business and Software with Business specialisations will be sought in 2014.</p> <p><b>EUR-ACE®</b></p> <p>The following streams have been accredited by EUR-ACE®: Biomedical, Biochemical, Chemical, Civil, Electrical, Environmental, Geomatics, Mechanical, Mechatronics, Software and Structural specialisations.</p> <p><b>Australian Computer Society</b></p> <p>The Master of Engineering (Software) has been awarded Professional level accreditation.</p> <p><b>IChemE</b></p> <p>IChemE has accredited the Chemical and Biochemical specialisations.</p> <p><b>Royal Institution of Chartered Surveyors</b></p>

	The Royal Institution of Chartered Surveyors has awarded provisional accreditation to the Geomatics specialisation.
<b>Generic Skills:</b>	<p>Master of Engineering graduates are expected to have the following qualities and skills:</p> <ul style="list-style-type: none"> <li># An advanced understanding of the changing knowledge base in their specialist area of engineering</li> <li># An ability to evaluate and synthesise the research and professional literature in their specialised area of engineering</li> <li># Advanced skills and techniques applicable to their specialist area of engineering</li> <li># Well-developed problem-solving abilities in the specialist area of engineering, characterised by flexibility of approach</li> <li># Advanced competencies in engineering professional expertise and scholarship</li> <li># A capacity to articulate their knowledge and understanding in oral and written presentations</li> <li># An advanced understanding of the international context and sensitivities of their specialist area within engineering</li> <li># An appreciation of the design, conduct and reporting of original research</li> <li># A capacity to manage competing demands on time, including self-directed project work</li> <li># A profound respect for truth and intellectual integrity, and for the ethics of scholarship</li> <li># An appreciation of the ways in which advanced knowledge equips the student to offer leadership in the specialist area</li> <li># The capacity to value and participate in projects which require team-work</li> <li># An understanding of the significance and value of their knowledge to the wider community (including business and industry)</li> <li># A capacity to engage where appropriate with issues in contemporary society, and</li> <li># Advanced working skills in the application of computer systems and software and a receptiveness to the opportunities offered by new technologies</li> </ul>
<b>Links to further information:</b>	<a href="http://www.eng.unimelb.edu.au/ME/">http://www.eng.unimelb.edu.au/ME/</a>
<b>Notes:</b>	