MR-PHILENG Master of Philosophy - Engineering

Year and Campus:	2013 - Parkville
CRICOS Code:	061951C
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Level:	Research Higher Degree
Duration & Credit Points:	Students are expected to complete this research in 1.50 years full time, or equivalent part time. Credit Points: 150
Coordinator:	..
Contact:	Melbourne School of Engineering Ground Floor, Old Engineering (Building 173) Current Students: Email:**13MELB@unimelb.edu.au (mailto:13MELB@unimelb.edu.au)** Phone: 13 MELB (13 6352) +61 3 9035 5511 Prospective Students: Email: **eng-info@unimelb.edu.au (mailto:eng-info@unimelb.edu.au)** Phone: + 61 3 8344 6944 **http://www.gradresearch.unimelb.edu.au/ (http://www.gradresearch.unimelb.edu.au/)**
Course Overview:	The MPhil is an internationally recognised masters (by research) degree. It is designed for students to develop advanced skills in carrying out independent and sustained research. The thesis should demonstrate a critical application of specialist knowledge and make an independent contribution to existing scholarship in the area of research. The normal length of an MPhil thesis is 30,000-40,000 words, exclusive of words in tables, maps bibliographies and appendices. Footnotes are included as part of the word limit.

Objectives:	On completion of the course students should be able to:
	
	  # demonstrate advanced learning in research skills and mastery of appropriate techniques, such as the use of archival or primary evidence, analysis of data, judgment of conflicting evidence etc;
	  # demonstrate specialist knowledge in the area of their research;
	  # present the results of their research in publishable quality or work towards incorporating their findings in further research;
	  # gain access to certain types of employment through this specialist qualification;
	  # demonstrate an understanding of, and commitment to, research ethics or code of practice.

Course Structure & Available Subjects:	All candidates for the MPhil will be examined on the basis of their thesis. A candidate will have appropriately experienced supervisor/s and an Advisory Committee who in consultation with the candidate, arranges a course of supervised research designed to suit the individual requirements and interests of the candidate. A candidate may be required to supplement their research program by attendance at, or enrolment in, additional subjects if considered necessary by the supervisor(s). Students are required to successfully complete two coursework subjects before they are eligible to apply to convert from MR-PHILENG Master of Philosophy to 351AA PhD Engineering. All students are required to attend departmental seminars over the period of their candidature.
Subject Options:	All students are required to complete a minimum of two subjects and a maximum of four chosen from the list below with the approval of the student's supervisor. Graduate/Postgraduate subjects NOT listed below may be selected in consultation with the student's supervisor and are subject to the endorsement of the subject coordinator and Head of Department.

If a student does not have sufficient background in the subjects they may be required by the supervisory panel to take preliminary undergraduate subjects. Undergraduate preliminary subjects will not count towards the postgraduate level coursework requirement. Other subjects may be selected in consultation with the supervisor and the department, and are subject to the written approval of the Head of Department.

Students in the following Departments may select subjects from the list below;

- # Chemical and Biomolecular Engineering
- # Computing and Information Systems
- # Infrastructure Engineering
- # Mechanical Engineering

Subjects Available:

Biomedical Engineering

Subject	Study Period Commencement:	Credit Points:
BMEN90002 Neural Information Processing	Not offered 2013	12.50
BMEN90004 Advanced Neural Information Processing	Not offered 2013	12.50
BMEN90011 Tissue Engineering & Stem Cells	Not offered 2013	12.50
BMEN90012 Soft Matter Engineering	Not offered 2013	12.50
BMEN90021 Medical Imaging	Not offered 2013	12.50
BMEN90022 Computational Biomechanics	Not offered 2013	12.50
BMEN90024 Human Impact & Forensic Biomechanics	Not offered 2013	12.50
ELEN90071 Auditory and Visual Processing	Not offered 2013	12.50

Chemical and Biomolecular Engineering

Subject	Study Period Commencement:	Credit Points:
CHEN90007 Advanced Thermo & Reactor Engineering	Not offered 2013	12.50
CHEN90010 Minerals, Materials and Recycling	Not offered 2013	12.50
CHEN90011 Bioenvironmental Engineering	Not offered 2013	12.50
CHEN90019 Advanced Heat & Mass Transport Processes	Not offered 2013	12.50
CHEN90027 Carbon Capture and Storage	Not offered 2013	12.50
ENGR90024 Computational Fluid Dynamics	Not offered 2013	12.50
CHEN90034 Research Methods	Not offered 2013	12.50

Computing and Information Systems Engineering

Subject	Study Period Commencement:	Credit Points:
BINF90002 Elements of Bioinformatics	Not offered 2013	12.50
COMP90007 Internet Technologies	Not offered 2013	12.50
COMP90014 Algorithms for Functional Genomics	Not offered 2013	12.50
COMP90015 Distributed Systems	Not offered 2013	12.50
COMP90016 Computational Genomics	Not offered 2013	12.50

COMP90017 Sensor Networks and Applications	Not offered 2013	12.50
COMP90018 Mobile Computing Systems Programming	Not offered 2013	12.50
COMP90019 Distributed Computing Project	Semester 1	25
COMP90020 Distributed Algorithms	Not offered 2013	12.50
COMP90024 Cluster and Cloud Computing	Semester 2	12.50
COMP90025 Parallel and Multicore Computing	Not offered 2013	12.50
COMP90038 Algorithms and Complexity	Not offered 2013	12.50
COMP90041 Programming and Software Development	Not offered 2013	12.50
COMP90042 Web Search and Text Analysis	Not offered 2013	12.50
COMP90043 Cryptography and Security	Not offered 2013	12.50
COMP90044 Research Methods	Not offered 2013	12.50
COMP90045 Programming Language Implementation	Not offered 2013	12.50
COMP90046 Constraint Programming	Not offered 2013	12.50
COMP90048 Declarative Programming	Not offered 2013	12.50
COMP90049 Knowledge Technologies	Not offered 2013	12.50
COMP90050 Advanced Database Systems	Not offered 2013	12.50
COMP90051 Statistical and Evolutionary Learning	Not offered 2013	12.50
COMP90053 Program Analysis and Transformation	Not offered 2013	12.50
COMP90054 Software Agents	Not offered 2013	12.50
GEOM90018 Spatial Databases	Not offered 2013	12.50
GEOM90042 Spatial Information Programming	Not offered 2013	12.50
ISYS90026 Fundamentals of Information Systems	Not offered 2013	12.50
ISYS90031 Research Methods in Information Systems	Not offered 2013	12.50
ISYS90032 Emerging Technologies and Issues	Not offered 2013	12.50
ISYS90034 B2B Electronic Commerce	Not offered 2013	12.50
ISYS90035 Knowledge Management Systems	Not offered 2013	12.50
ISYS90036 Enterprise Systems	Not offered 2013	12.50
ISYS90037 Managing IS Projects: People & Politics	Not offered 2013	12.50
ISYS90038 IS Strategy and Governance	Semester 1	12.50
ISYS90039 Innovation & Entrepreneurship in IT	Not offered 2013	12.50
ISYS90040 Managing Change for IS Professionals	Not offered 2013	12.50
ISYS90043 Enterprise Applications & Architectures	Not offered 2013	12.50
ISYS90045 Professional IS Consulting	Not offered 2013	12.50
ISYS90048 Information Technology Infrastructure	Not offered 2013	12.50

ISYS90049 Process Analysis Modelling and Design	Semester 2	12.50
ISYS90050 IT Project and Change Management	Not offered 2013	12.50
ISYS90051 Impact of Digitisation	Not offered 2013	12.50
ISYS90052 Managing Large Projects	Not offered 2013	12.50
ISYS90053 Managing IT Services	Not offered 2013	12.50
ISYS90055 Managing IT Outsourcing	Semester 2	12.50
ISYS90068 Service Science	Not offered 2013	12.50
ISYS90069 eHealth & Biomedical Informatics Systems	July	12.50
ISYS90070 Information Security Consulting	Not offered 2013	12.50
SCIE90004 Science in Context	Not offered 2013	12.50
SCIE90007 E-Science	Not offered 2013	12.50
SINF90001 Database Systems & Information Modelling	Not offered 2013	12.50
SINF90002 Interaction Design and Usability	Not offered 2013	12.50
SINF90004 Data Warehousing	Not offered 2013	12.50
SINF90007 Pervasive Computing	Semester 2	12.50
SKIL90004 Project Management in Science	Not offered 2013	12.50
SWEN90002 Engineering for Internet Applications	Not offered 2013	12.50
SWEN90006 Software Engineering Methods	Not offered 2013	12.50
SWEN90007 Software Design and Architecture	Not offered 2013	12.50
SWEN90008 Software Processes and Management	Not offered 2013	12.50
SWEN90009 Software Requirements Analysis	Not offered 2013	12.50
SWEN90010 High Integrity Systems Engineering	Not offered 2013	12.50

Infrastructure Engineering

Subject	Study Period Commencement:	Credit Points:
CVEN90016 Concrete Design and Technology	Not offered 2013	12.50
CVEN90017 Earthquake Resistant Design of Buildings	Not offered 2013	12.50
CVEN90018 Structural Dynamics and Modelling	Semester 2	12.50
CVEN90019 Sustainable Water Resources Systems	Not offered 2013	12.50
CVEN90024 High Rise Structures	Not offered 2013	12.50
CVEN90026 Extreme Loading of Structures	Not offered 2013	12.50
CVEN90027 Geotechnical Applications	Not offered 2013	12.50
CVEN90035 Structural Theory and Design 3	Not offered 2013	12.50
CVEN90043 Sustainable Infrastructure Engineering	Not offered 2013	12.50
CVEN90044 Engineering Site Characterisation	Not offered 2013	12.50

CVEN90048 Transport Systems	Not offered 2013	12.50
CVEN90050 Geotechnical Engineering	Not offered 2013	12.50
ENEN90005 Environmental Management ISO 14000	Not offered 2013	12.50
ENEN90006 Solid Wastes to Sustainable Resources	Not offered 2013	12.50
ENEN90011 Energy Efficiency Technology	Not offered 2013	12.50
ENEN90014 Sustainable Buildings	Not offered 2013	12.50
ENEN90027 Energy for Sustainable Development	Not offered 2013	12.50
ENEN90028 Monitoring Environmental Impacts	Not offered 2013	12.50
ENEN90029 Water and Waste Water Management	Semester 1	12.50
ENEN90030 Contaminant Hydrogeology	Not offered 2013	12.50
ENEN90031 Quantitative Environmental Modelling	Not offered 2013	12.50
ENEN90032 Environmental Analysis Tools	Not offered 2013	12.50
ENEN90033 Solar Energy	Not offered 2013	12.50
ENEN90034 Environmental Applied Hydrology	Not offered 2013	12.50
ENGM90006 Engineering Contracts and Procurement	Not offered 2013	12.50
ENGM90007 Project Management Practices	Not offered 2013	12.50
ENGR90026 Engineering Entrepreneurship	Not offered 2013	12.50
GEOM90005 Remote Sensing	Not offered 2013	12.50
GEOM90006 Spatial Analysis	Not offered 2013	12.50
GEOM90007 Spatial Visualisation	Not offered 2013	12.50
GEOM90008 Foundations of Spatial Information	Not offered 2013	12.50
GEOM90015 Spatial Data Infrastructure	Not offered 2013	12.50
GEOM90016 Advanced Topics in GIScience	Not offered 2013	12.50
GEOM90018 Spatial Databases	Not offered 2013	12.50
GEOM90033 Satellite Positioning Systems	Not offered 2013	12.50
GEOM90035 Residential Land Development	Not offered 2013	12.50
GEOM90038 Advanced Imaging	Not offered 2013	12.50
GEOM90039 Advanced Surveying and Mapping	Not offered 2013	12.50
GEOM90040 Geomatics Problem Solving and Analysis	Not offered 2013	12.50
GEOM90041 Cadastral Surveying	Not offered 2013	12.50
GEOM90042 Spatial Information Programming	Not offered 2013	12.50

Mechanical Engineering

Subject	Study Period Commencement:	Credit Points:
ELEN90064 Advanced Control Systems	Semester 2	12.50

ENGR90019 Adv Topics in Fluid Mechanics	Semester 2	12.50
ENGR90020 Adv Topics in Biomechanics	Not offered 2013	12.50
ENGR90026 Engineering Entrepreneurship	Not offered 2013	12.50
MCEN90010 Finance & Human Resources for Engineers	Not offered 2013	12.50
MCEN90017 Advanced Motion Control	Semester 2	12.50
MCEN90018 Advanced Fluid Dynamics	Not offered 2013	12.50
MCEN90019 Advanced Thermodynamics	Not offered 2013	12.50
MCEN90020 Advanced Materials	Not offered 2013	12.50
MCEN90023 Quality and Reliability	Not offered 2013	12.50
MCEN90027 Simulation Of Mechatronic Systems	Not offered 2013	12.50
MCEN90028 Robotics and Automation Systems	Not offered 2013	12.50
MCEN90029 Advanced Solid Mechanics	Not offered 2013	12.50
MCEN90031 Applied High Performance Computing	Not offered 2013	12.50
MCEN90032 Sensor Systems	Not offered 2013	12.50

Graduate School of Science
School of Botany

Subject	Study Period Commencement:	Credit Points:
BIOL90001 Microscopy for Biological Sciences	Not offered 2013	12.50

School of Chemistry

Subject	Study Period Commencement:	Credit Points:
CHEM90008 Advanced Spectroscopy	Not offered 2013	12.50
CHEM90009 Chemical Synthesis & Characterisation 1	Semester 1	12.50
CHEM90010 Advanced Chemical Applications 1	Not offered 2013	12.50
CHEM90017 Chemical Synthesis & Characterisation 2	Not offered 2013	12.50
CHEM90018 Advanced Chemical Applications 2	July	12.50

Department of Mathematics and Statistics

Students are permitted to undertake the Department of Mathematics and Statistics, Masters level Mathematics and Statistics subjects, excluding MAST90007: Statistics for Research Workers.

Subject	Study Period Commencement:	Credit Points:
MAST90009 Business Forecasting	Not offered 2013	12.50
MAST90011 Modelling: Mathematical Biology	Not offered 2013	12.50
MAST90012 Measure Theory	Not offered 2013	12.50
MAST90013 Network Optimisation	Not offered 2013	12.50
MAST90014 Optimisation for Industry	Not offered 2013	12.50

Subject	Study Period Commencement:	Credit Points:
MAST90017 Representation Theory	Not offered 2013	12.50
MAST90019 Random Processes	Not offered 2013	12.50
MAST90020 Functional Analysis	Not offered 2013	12.50
MAST90023 Algebraic Topology	Not offered 2013	12.50
MAST90025 Commutative and Multilinear Algebra	Not offered 2013	12.50
MAST90026 Computational Differential Equations	Not offered 2013	12.50
MAST90027 The Practice of Statistics	Not offered 2013	12.50
MAST90029 Differential Topology and Geometry	Not offered 2013	12.50
MAST90030 Advanced Discrete Mathematics	Not offered 2013	12.50
MAST90031 Enumerative Combinatorics	Not offered 2013	12.50
MAST90045 Systems Modelling and Simulation	Not offered 2013	12.50
MAST90050 Scheduling and Optimisation	Not offered 2013	12.50
MAST90051 Mathematics of Risk	Not offered 2013	12.50
MAST90053 Experimental Mathematics	Not offered 2013	12.50
MAST90056 Riemann Surfaces and Complex Analysis	Not offered 2013	12.50
MAST90057 Elements of Probability	Not offered 2013	12.50
MAST90058 Elements of Statistics	Not offered 2013	12.50
MAST90059 Stochastic Calculus with Applications	Not offered 2013	12.50
MAST90060 Mathematical Statistical Mechanics	Semester 1	12.50
MAST90061 Modern Statistical Methods	Not offered 2013	12.50
MAST90062 Probability & Mathematical Statistics I	Not offered 2013	12.50
MAST90063 Probability & Mathematical Statistics II	Not offered 2013	12.50
MAST90064 Advanced Methods: Differential Equations	Not offered 2013	12.50
MAST90065 Exactly Solvable Models	Not offered 2013	12.50
MAST90066 Continuum Mechanics and Applications	Not offered 2013	12.50
MAST90067 Advanced Methods: Transforms	Not offered 2013	12.50
MAST90068 Groups, Categories & Homological Algebra	Not offered 2013	12.50
MAST90069 Introduction to String Theory	Not offered 2013	12.50

School of Physics

Subject	Study Period Commencement:	Credit Points:
PHYC90006 Quantum and Advanced Optics	Not offered 2013	12.50
PHYC90007 Quantum Mechanics	Not offered 2013	12.50

Electrical and Electronic Engineering

Electrical and Electronic Engineering students may select subjects from the list below;

Subjects Available:

Subject	Study Period Commencement:	Credit Points:
BMEN90004 Advanced Neural Information Processing	Not offered 2013	12.50
ELEN90017 Advanced Studies 1 (Electrical)	Semester 1	12.50
ELEN90018 Advanced Studies 2 (Electrical)	Semester 2	12.50
ELEN90022 Quantum Opto-electronics	Not offered 2013	12.50
ELEN90023 Lightwave Devices and Systems	Not offered 2013	12.50
ELEN90024 Wireless Systems	Not offered 2013	12.50
ELEN90025 Communication Network Standards/Protocol	Not offered 2013	12.50
ELEN90026 Introduction to Optimisation	Semester 2	12.50
ELEN90027 Linear Systems Theory	Not offered 2013	12.50
ELEN90028 Nonlinear Systems Theory	Semester 1	12.50
ELEN90030 Information Theory	Semester 2	12.50
ELEN90031 Advanced Topics in Communications	Semester 1	12.50
ELEN90032 Advanced Topics in Signals and Systems	Not offered 2013	12.50
ELEN90033 Advanced Topics in Photonics	Semester 1	12.50
ELEN90071 Auditory and Visual Processing	Not offered 2013	12.50

Computing and Information Systems Engineering

Subject	Study Period Commencement:	Credit Points:
COMP90044 Research Methods	Not offered 2013	12.50

Graduate School of Science
Department of Mathematics and Statistics

Students are permitted to undertake the Department of Mathematics and Statistics, Masters level Mathematics and Statistics subjects, listed above excluding MAST90007: Statistics for Research Workers.

School of Physics

Subject	Study Period Commencement:	Credit Points:
PHYC90006 Quantum and Advanced Optics	Not offered 2013	12.50
PHYC90007 Quantum Mechanics	Not offered 2013	12.50

| Entry Requirements: | MPhil applicants will be assessed using the criteria described below. The measures include an assessment of a candidate's knowledge of the discipline and evidence of their ability to complete a rigorous research project. Applicants are required to meet the minimum standards described for each of the 6 measures.

In exceptional circumstances, the RHD Committee may consider for admission a person who does not have qualifications equivalent to a four-year honours degree, if it is satisfied that the person's experience in research and the results of that experience are so outstanding that the person is likely to have the ability to pursue the course successfully. In such cases, or where other minimum standards as specified below are not all met, the department may present an evidence-based case for admittance to the Chair Research Higher Degrees Committee.

Normally, the evidence of research equivalence would take the form of a research publication record and/or additional significant research experience that would be equivalent to a fourth |
|---|---|

year. In the case of a three-year honours degree from the United Kingdom the sponsoring Department may also provide evidence about the quality of the institution and the quality of the degree, compared with a four-year honours degree.

Criteria for assessing applicants eligibility for MPhil candidature

1. *Minimum qualifications*

Applicants are normally required to have completed at least a four-year honours degree at H2A standard from an Australian university, or a qualification or combination of qualifications considered by the RHD Committee to be equivalent.

2. *Minimum level of academic achievement*

Applicants should have achieved an overall H1 (80-100%) or H2A (75-79%) grade in the relevant honours or Masters degree.
Applicants who have completed certain professional degrees such as MBBS, BVSc, LLB, JD, BPhysio, BProp&Const, BUrbPl, BArch and BLArch will be assessed individually.

3. *Relevance of the Degree*

The completed degree must be in an area that is relevant to the intended MPhil, including sufficient specialisation such that the applicant will have already developed an understanding and appreciation of a body of knowledge relevant to the intended MPhil. Professional experience in the area of the intended MPhil may be deemed equivalent.

4. *Evidence of research ability*

Applicants are normally required to have completed a research project, component, subject or group of subjects that accounts for at least 25% of their work (i.e. Honours year), or 25% of one year accumulated over the length of a Masters course, and which has, or have, been conducted, and assessed, individually. Research carried out in groups should at least have been graded individually. This project, component, or subject(s) may include:

(a) any obviously research oriented project, subject or sustained piece of scholarly writing conducted for assessment, such as small theses, research essays, long essays, or studios; AND/OR

(b) any less-obviously research subjects, including practice-based subjects such as performance or fieldwork, where there is also scholastic rigor as documented in a sustained piece of writing analogous to (a); AND/OR

(c) any subjects directed at the formation of research skills, such as methodology and reasoning, such as scientific reasoning, or legal reasoning, where a sustained piece of writing has also been produced.

5. *Currency of applicant's knowledge of the discipline*

The applicant's degree/s and/or professional experience must demonstrate that their knowledge of the discipline in which they plan to undertake their research higher degree is current. It is therefore expected that an applicant will have completed their tertiary studies and/or any relevant professional experience in the 10 years immediately prior to their intended entry to the MPhil.

6. *Assessment of level of suitabiltiy*

Based on interview or other verbal communication, an assessment should be made of the level of understanding, motivation and time commitment of the student for the proposed program of study. For example, a full-time student would be expected to devote at least 40 hours a week and a part-time student about half of this.

Core Participation Requirements:	All MPhil candidates are required to complete the equivalent of at least six months full-time (12 months part-time) advanced study and research at the University unless studying at an outside institution approved by the Research Higher Degrees Committee (RHDC). The RHDC will not approve entirely distance supervision or entirely on-line supervision for research higher degree students.Throughout their candidature candidates are expected to attend the University in order to benefit from planning, conducting and writing up their research within a University community and environment.The residency requirement is deemed especially important during the first six months of candidature. During this time the student is expected to interact on a regular basis with the supervisor, the department (including staff and other research students) and the University, so as: to build the skills and knowledge necessary to carry out the proposed research program to acquire an understanding of the standards and requirements for an MPhil awarded by the University to make use of support programs and facilities provided by the Melbourne School of Graduate Research throughout candidature. It is University 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 University's programs. Students who feel their disability will impact on meeting the requirements of this course are encouraged to discuss this matter with a Faculty Student Adviser and the Disability Liaison Unit.
Graduate Attributes:	Research Masters degrees at the University of Melbourne seek to develop graduates who have a capacity for defining and managing a research project characterised by originality and independence. Their training equips them for more sustained and original work at the doctoral level or for applied research positions in a wide variety of contexts. The University expects its research Masters graduates to have the following qualities and skills: an ability to initiate research projects and to formulate viable research questions; a demonstrated capacity to design, conduct and report independent and original research on a closely-defined project; an ability to manage time to maximise the quality of research; an understanding of the major contours of international research in the research area; a capacity for critical evaluation of relevant scholarly literature; well-developed and flexible problem-solving abilities appropriate to the discipline; the ability to analyse research data within a changing disciplinary environment; the capacity to communicate effectively the results of research and scholarship by oral and written communication; an understanding of and facility with scholarly conventions in the discipline area; a profound respect for truth and intellectual integrity, and for the ethics of research and scholarship; a capacity to cooperate with other researchers; an ability to manage information effectively, including the application of computer systems and software where appropriate to the student's field of study.
Links to further information:	http://www.gradresearch.unimelb.edu.au
Notes:	Application Procedure
	Detailed information for prospective MPhil students regarding the application process, including the application form is available at **http://www.futurestudents.unimelb.edu.au/grad/research (http://www.futurestudents.unimelb.edu.au/grad/research)** . It is important to note that there is a separate application form for local and international students. MPhil applicants should discuss their research interests with a potential supervisor at the department in which they would like to enrol prior to submitting an application. The **Find an Expert (http://www.findanexpert.unimelb.edu.au/)** website may assist you to find an appropriate supervisor. Prospective MPhil candidates should also investigate department websites for information on current research and contact details. Department websites are easily accessed from **faculty homepages (http://www.unimelb.edu.au/az/ faculties.html)** . Applications are accepted year-round. Which scholarship can I apply for?
	Students can find information about graduate research scholarships offered by the University of Melbourne at the **Melbourne Scholarships Office (http://cms.services.unimelb.edu.au/ scholarships/pgrad)** . Facilities and Supports:
	The Melbourne School of Graduate Research makes available a broad range of **Programs & Services (http://www.gradresearch.unimelb.edu.au/programs/)** available to graduate research students.