

MASTER OF ENGINEERING MANAGEMENT

(Part of a new Graduate Engineering Management program)

1. Background

The Graduate Engineering Management program involves:

- A one year Master in Engineering Management
- Graduate Certificate/Diploma in Engineering Management as pathways to the one-year masters
- An additional stream (Engineering Management) in the existing eighteen month Master of Engineering Science and the Master of Applied Science. The Master of Engineering/Applied Science incorporating the one year Master of Engineering Management plus one semester of research and research report writing.
- A two year Master in Engineering Management incorporating the one year masters and the Graduate Diploma for overseas students into one program making the visa process simpler and the offer more attractive with direct entry to the Masters program. Students will still be able to exit with a Graduate Certificate or Diploma if appropriate.

The new program builds on the existing Graduate program in the International Technologies Centre (IDTC) of the Department of Civil and Environmental Engineering and is part of IDTC's strategy to expand and improve the flexibility of the program to cater for a broader range of domestic and international students. This proposal also reflecting part of broader University strategic and operational goals of increasing the number of full fee postgraduate coursework enrolments

The introduction of this new course is in response to:

1. Students whose first degree is in Engineering are requiring a higher degree with a commercial/technological/management combination.
2. A gap in availability of a technical professional business course for students from technical quantitative and analytical academic background.

Internationally similar Engineering courses exist in top Universities in the UK and USA and in Australia at the UNSW and RMIT University.

The proposed course will enable students to acquire an overview of the legal, commercial, marketing and human issues that a manager in a technical environment needs to be aware of and which are often not covered in the undergraduate education of engineers and scientists. The IDTC program already includes the related management courses of:

- Engineering Project Management - a course that deals specifically with Civil Engineering construction projects and does not cover projects in other spheres of Engineering.
- Utilities Management - a course that deals with issues of management of assets of technological utilities organisations – public or private.

2. Entry requirements

The Selection Committee will evaluate the applicant's ability to pursue successfully the *100 point Masters* course using the following criteria-

- a four-year degree in Engineering or a Science honours degree including mathematics or equivalent, normally with an average grade of at least H2B (70%) (University of Melbourne equivalent) or
- a Graduate Diploma in Engineering normally with an average grade of at least 70% (University of Melbourne equivalent)
- a three-year degree in an Engineering or Science related discipline, or equivalent normally with an average grade of at least H2B (70%), and with at least two years relevant work experience

The Selection Committee may conduct interviews and tests and call for referees' reports and employer references to elucidate any of the matters referred to above.

The Selection Committee will evaluate the applicant's ability to pursue successfully the *Graduate Certificate, Diploma in Engineering or the 200 point Masters* course using the following criteria-

- a three year degree in Engineering or a Science related discipline normally with an average grade of at least H3 (65%) (University of Melbourne equivalent)

The Selection Committee may conduct interviews and tests and call for referee reports and employer references to elucidate any of the matters referred to above.

Students may be selected into these programs under the lower English Language provisions of Regulation 11.1.R3

English Language Requirements are:

Original evidence of an English Language test score at a sitting within the last 24 months of paper-based TOEFL 580 (TWE 4.5), or computer-based TOEFL 233 (ERS 4.5) or IELTS 6.5 (Academic Reading and Academic Writing modules must be taken and a minimum band score of 6 is required in the Academic Writing module).

or

A TOEFL score of at least 550, with a TWE of 4 or the computer based TOEFL of at least 213 with an Essay Rating Score of 4 or an IELTS score of at least 6 and agreeing to undertake and pass an ESL subject in your first semester of study here. This subject would be taken in addition to the program offered above and may extend the length and subsequent cost of your course. You will also be required to take an IELTS test, at the University's expense, after one year of study to try to establish the effectiveness of the University's English Language program in improving the English Language facility of students who elect to enter with the lower English Language requirements.

3. Course Structure

The course structure for the Engineering Management program is consistent with the existing IDTC program, as follows:

Graduate Certificate and Diploma

Candidates may exit the Graduate program with a Graduate Certificate after completing 50 points, or a Graduate Diploma after completing 100 points. The Certificate or Diploma will be labelled with a stream specialisation, provided the candidate satisfies the specific requirements of the course.

To receive a Graduate Certificate or Diploma, a candidate must undertake the prescribed subjects and achieve a grade $\geq 50\%$ in all subjects.

A candidate enrolled in a Graduate Diploma who does not pass all 8 subjects may graduate with a Graduate Certificate if the requirements for that award are met.

Candidates with a three-year degree and with no relevant, documented work experience must complete a Graduate Diploma in Engineering before entering the one year (100 points) Masters Program. The selection of subjects will be based on discussion with the respective Course Coordinator to ensure that the deficiencies in the candidate's academic background are adequately addressed.

Master of Engineering Management - 100 points:

Candidates are required to pass 100 points of level 5 and 6 subjects in accordance with the requirements of the course concerned.

Master of Engineering Management - 200 points

Candidates are required to pass 200 points of subjects. Normally this course will comprise of the Postgraduate Diploma (100 points) and the 100 point Masters. Students need to reach a 70% average in the first 100 points to proceed to the second 100 points of Masters level subjects.

Master of Engineering Science/Applied Science

Students are required to complete 100 points of level 5 and 6 subjects in accordance with the requirements of the respective Named Masters. In addition, a grade of $\geq 70\%$ in the subject 421-642 Research Project or equivalent. Additionally, students must undertake and pass 50 points of research normally over a full time semester.

Program Features

- Student intake may be in either Semester 1 or Semester 2.
- Students who complete a Graduate Certificate may apply to the Selection Committee to transfer to a 200 point Masters Degree with credits for subjects studied in the Graduate Certificate.
- The one year named masters students are required to pass 100 points of "masters level subjects" i.e. level 5 or above.
- Master of Eng Sc/ App Sc students are required to average 70% in the first 100 points of study and at least 70% in the subject 421-642 Research Project (12.5 pts) or equivalent before progressing to the research semester.

The specific requirements for the Master of Engineering Management and its pathway courses of Graduate Certificate & Diploma are:

Degree Type	Core Subjects (four subjects)	Restricted Electives	Elective Subjects
Graduate Certificate in Engineering (Engineering Management) (50 points) Note: Not more than two subjects may be at level 3 or below.	421-255 Engineering Business Management 421-355 Technoeconomic Decision Making or 436-365 Operations Analysis and Design 436-415 Quality and Reliability And one of: 433-443 Software Project Management or 431-451 Project Man & Product Commercialisation		

	<p>or 421-405 Civil Engineering Project Management or 411-443 Chemical Engineering Management</p>		
<p>Graduate Diploma in Engineering (Engineering Management)</p> <p>(100 points)</p> <p>Note: Not more than two subjects may be at level 3 or below.</p>	As above		50 points of subjects chosen from Electives Table (Level 4 & 5) or such other subjects as are approved by the course coordinator (not more than 25 points by research and no more than 50 points of level 5 subjects)
<p>Master of Engineering Management</p> <p>100 points</p>	<p>421-6xx Sustainable Supply Management 421-6xx Financial Analysis of Complex Projects 421-6xx Management of Technological Enterprises</p>	<p>2 subjects from the three subjects below:</p> <p>325-694 Innovation Management. 421-6xx Engineering Systems Management 4216xx Principles of Public Private Partnerships</p>	37.5 points of subjects chosen from Electives Table (Level 6) or such other subject as are approved by the Course Coordinator (Not more than 25 points by research)
Master of Engineering Management 200 point option	As for the Graduate Diploma (100 points) above and the Master of Engineering Management (100 points) above.		
<p>Master of Engineering Science or Master of Applied Science in Engineering Management</p> <p>150 points option.</p> <p>Note: Hurdle to entry to MEngSci/MappSci from the Master of Engineering Management is that the student must study and score at least 70% in the 12.5 or 25 point research project and must achieve at least 70% overall in the 100 point Masters.</p>	<p>As for Master of Engineering Management plus:</p> <p>421-642 Research Project (12.5 points) 421-644 Research Project (50 points)</p>		25 points of subjects chosen from Electives Tables (Level 5 & 6) or such other subject as are approved by the Course Coordinator.

Available Subjects

The following subjects are available as electives for the program:

Existing Level 4 Subjects (Certificate and Diploma Programs only).

421-405	Management for Engineers 3
421-408	Construction Management
421-410	Structural Steel Theory and Design
421-411	Concrete Theory and Design
421-413	Computer-Aided Design
421-414	General Structural Design
421-415	High Rise Structures
421-416	Concrete Design State of the Art
421-417	Numerical Analysis and Computer Methods
421-420	Hydraulic Engineering Design
421-421	Coast and Harbour Engineering
421-423	River Hydraulics
421-425	Earthquake Engineering
421-426	Structural Dynamics
421-439	Geotechnical Applications
421-447	Transport Engineering
421-448	Transport Systems
421-453	Engineering Systems Management
421-456	Engineering Management 3E
421-480	Quantification of Physical Processes
421-482	Analysis and Design of Environmental Systems
436-466	Renewable Energy
436-467	Resources Applications & Environment
436-469	Refrigeration, A/C & Alternative Fuels

Existing Level 5 Subjects

Level 5 subjects are based on the existing Level 4 subjects. The general conversion criteria is based on the principle that Graduate students must be required to undertake more extensive project and essay tasks to foster independent thinking and individual initiative as well as essential engineering design and synthesis skills. This change in the profile of the workload is reflected in the subject assessment. In this context, Level 5 subjects are based on the same number of contact hours as their parent Level 4 subjects, but contain additional work requirements in the form of design projects, essays and special investigation on one topic related to the subject. Accordingly, the subject assessment profile reflects the increased weighting of problem-based tasks.

421-505	Engineering Hydraulics
421-511	Advanced Concrete Theory Design
421-512	Structural Dynamics
421-513	Computer Aided Design (Masters)
421-514	General Structural Design (Masters)
421-517	Earthquake Engineering (Masters)
421-516	Canal and River Hydraulics
421-539	Geotechnical Applications ((Masters)
421-547	Transport Engineering (Masters)
421-548	Transport Systems (Masters)

421-553	Engineering Systems Management (Masters)
421-518	Applied Hydrology
421-525	Field Data Acquisition and Analysis (Masters)
421-522	Environmental Engineering Design (Masters)
421-519	Analysis & Design – Environmental Systems (masters)
421-520	Canal Hydraulics
421-521	Coast and Harbour Engineering (Masters)
421-580	Quantification of Physical Processes I (Masters)
421-581	Quantification of Physical processes II (Masters)
436-523	Introduction to Occupational, Health & Safety
436-569	Refrigeration, Air Conditioning & Alternative Fuels (Masters)
436-567	Resources Application and Environment (Masters)
436-566	Renewable Energy (Masters)

Existing Level 6 Subjects

421-602	Gaseous & Atmospheric Wastes
421-604	Environmental Management: Systems & Audits
421-605	Liquid & Liquid Borne Wastes & Pollutants
421-606	Solid Wastes & Pollutants
421-609	Social and Political Context of Technology
421-616	Technology Assessment
421-619	Energy for Sustainable Development
421-624	Special Studies in Hydraulic Engineering
421-625	Case Studies in Development Technologies
421-626	Design of Energy Systems
421-627	Sustainable Development & Management of Water Resources
421-628	Design & Management of Irrigation & Drainage Systems
421-629	Energy Efficiency Technology
421-635	Special Studies in Geotechnical Engineering
421-636	Fortran Programming for Engineering Applications
421-637	Indoor Air Quality
421-640	Public Health in Hot Climates
421-641	Travel Demand Forecasting and Analysis
421-642	Research Project (12.5 pts)
421-643	Research Project (25.0 pts)
421-644	Research Project (50.0 pts)
421-645	Special Studies in Transport and Land Use Planning
421-648	Water Sources of Energy
421-649	Special Studies
421-650	Preliminary Studies
421-662	Special Studies in Systems Engineering
421-680	Engineering Interactions with the Environment
421-681	Management for the Environment
421-825	Energy from Biomass and Wastes
436-610	Fundamentals of Geographic Information Systems
436-624	Management of Geographic Information Systems
421-654	Principles of Asset Management
421-668	Management and Operation of Irrigation and Drainage Facilities
421-663	Engineering Project Management
421-664	Project Delivery
421-667	Project Management Practices
421-666	Management of Project Resources
421-670	Sustainable Buildings

New Level 6 Subjects (3) (Core)

421-6xx	Sustainable Supply Chain Management
421-6xx	Financial Analysis of Complex Projects
4216xx	Management of Technological Enterprises

New Level 6 Restricted Elective Subject (part of this course proposal)

4216xx	Engineering Systems Management
4216xx	Principles of Public Private Partnership

Existing elective subjects from the Faculty of Economics and Commerce (By arrangement with the Faculty Economics and Commerce)

316802 Macroeconomics for Managers
316660 Microeconomics and Strategy
325677 People, Organisations and Change
325678 Quality Management
325679 Supply Chain Management
325692 Decision Analysis
325693 Risk Management

Existing restricted elective subject from the Faculty of Commerce (By arrangement with the Faculty Economics and Commerce)

325-694 Innovation Management (with agreement that slight modification of current content will be made to include entrepreneurship and capital raising):

Electives from the Faculty of Economics and Commerce may be undertaken only after obtaining written agreement from the Engineering Course co-ordinator (to minimize overlap of subject material) and with a consent sign-off by the relevant Department in the Faculty of Economics and Commerce (to ensure the student has the appropriate pre-requisites) as well as approval from the Professional Programs Office of the Faculty of Economics & Commerce.

4. EFTSL and Budgetary Consequences

It is intended that the course will be available to both local and international students. It will be available to full-fee paying Australian students but will not be available by distance education.