THE UNIVERSITY OF MELBOURNE

ENGINEERING & IT

2017 STUDY GUIDE

eng.unimelb.edu.au

CONTENTS

WHY CHOOSE ENGINEERING AND IT AT MELBOURNE?

The University of Melbourne's School of Engineering and IT attracts students and staff of outstanding ability from around the world.

You will benefit from:

- A world class education of greater technical depth and breadth.
- Professionally accredited courses, many recognised by more than one accreditation body, allowing graduates to work in more countries around the world.
- Career opportunities in Australia and overseas, with qualifications that are recognised internationally.
- Fundamental engineering and IT knowledge that will set you up for a successful career, not just your first job.
- Advanced analytical, technical and communications skills valued by industry.
- Competitive access to Australia's leading entrepreneurship program – the Melbourne Accelerator Program.
- Industry based learning opportunities – competitive entry to internships and industry placements.
- Exposure to real-world industry and research projects that develop problem-solving and team work skills that are crucial in industry.
- Learning from academics, who are world leaders in their field, in an environment of cross-disciplinary research excellence, where important discoveries are being made.
- Generous scholarship programs that support diversity and acknowledge academic achievement.
- Being part of a community of scholars and practitioners, who are dedicated to creating a better world through engineering and IT.

#1
IN AUSTRALIA
#33
IN THE WORLD

Times Higher Education World University Rankings, 2015-2016

More info

13 MELB (13 6352)
International: +61 3 9035 5511
13MELB@unimelb.edu.au
eng.unimelb.edu.au
engit.eng.unimelb.edu.au
twitter.com/engunimelb
facebook.com/engunimelb
instagram.com/engunimelb

Professional Accreditation

Engineers Australia	Master of Engineering (in 11 technical specialisations)[1] Master of Engineering (with Business) (in 6 specialisations)[2]
EUR-ACE®	Master of Engineering (in 11 technical specialisations)[3]
Euro-Inf®	Master of Science (Computer Science)
The Australian Computer Society	Master of Information Systems Master of Information Technology (in 3 specialisations) Master of Engineering (Software)
Royal Institution of Chartered Surveyors	Master of Engineering (Spatial) Master of Information Technology (Spatial)
Surveyors Registration Board of Victoria	Master of Engineering (Spatial)[4]
IChemE	Master of Engineering (Biochemical) Master of Engineering (Chemical)

[1] The Master of Engineering (Spatial) is provisionally accredited, until sufficient students graduate from the program. All other technical specialisations are fully accredited.

[2] The Master of Engineering (with Business) program has been awarded full accreditation status by Engineers Australia in the following specialisations – Master of Engineering (Chemical with Business)/(Civil with Business) and (Mechanical with Business). The remaining specialisations, Master of Engineering (Biomedical with Business)/(Electrical with Business) and (Software with Business), will continue to be provisionally accredited until sufficient students have graduated from the program. Changes to accreditation status will be backdated, so that all graduates receive full accreditation when it is granted.

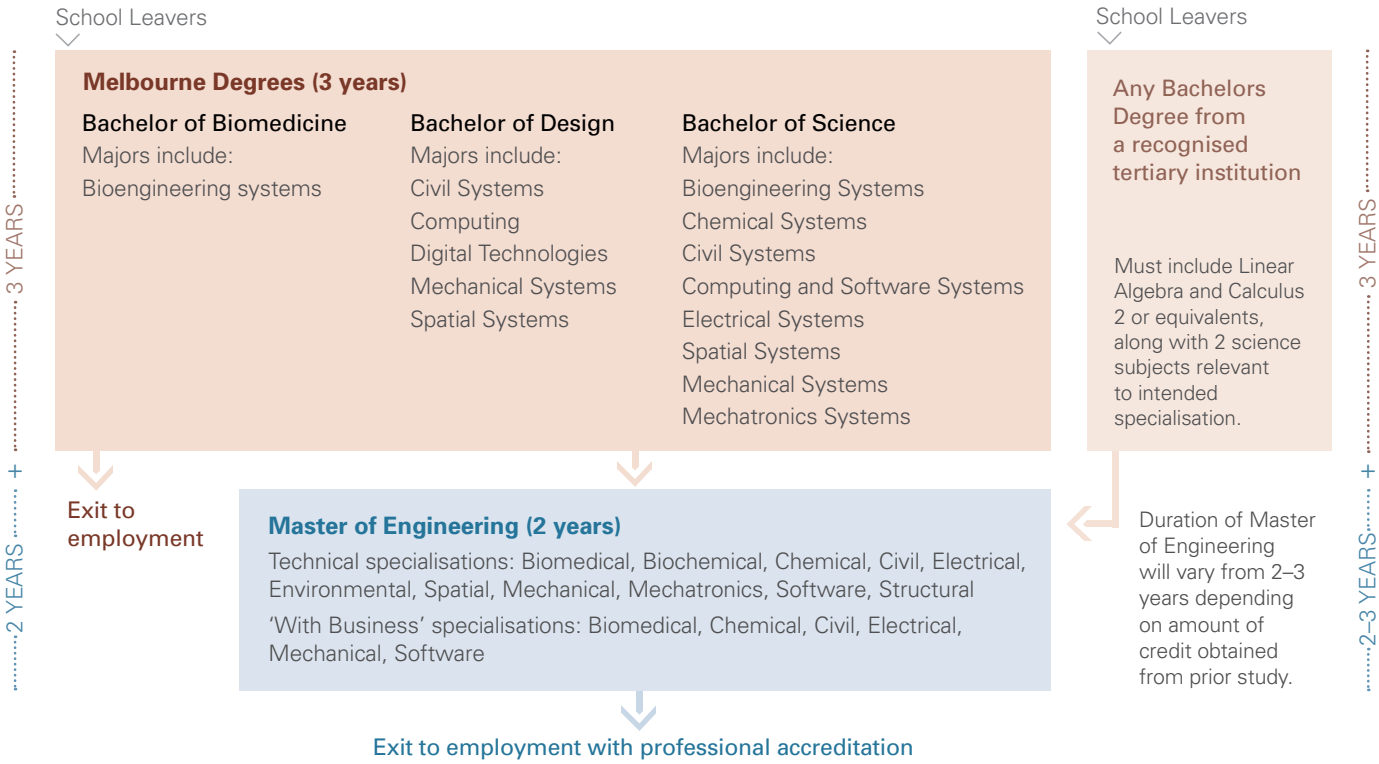
[3] An application for EUR-ACE® accreditation for the Master of Engineering (with Business) is currently underway.

[4] To be eligible to register as a licensed surveyor with the Surveyors Registration Board of Victoria, students must complete a prescribed set of spatial electives as follows: Property Law, Land Development, and Cadastral Surveying and graduate within the current accreditation cycle (i.e. before 31 December 2018).

HOW TO STUDY ENGINEERING AT MELBOURNE

To become a professionally accredited engineer, you will complete five years of study, starting with an engineering major in a three-year undergraduate degree, followed by a two-year Master of Engineering. A longer Master of Engineering program, of up to three-years duration is available for students, who have not completed the preliminary engineering subjects required in their undergraduate degree, but who meet the maths and science entry requirements.

Study options towards becoming an engineer



Study options for qualified engineers (and other professionals), who want to advance or change their careers.

Your qualification	Aim	Specialised Masters Course
Degree in Civil or Structural Engineering, and at least one year of relevant work experience.	Further your knowledge by studying with world leaders in ecologically sustainable buildings and structures that can withstand earthquakes, wind, fire and explosions.	Master of Engineering Structures
Degree in Electrical Engineering	Develop advanced knowledge and skills in optimal network design, management and security for modern telecommunications.	Master of Telecommunications Engineering
Degree in Commerce or Science or Engineering (work experience may be required, see pg. 6)	Open the door to a range of new and exciting career options in energy. You will learn the business, science and technology of energy, and develop expertise in evaluating energy systems, making energy-related investment decisions, designing and implementing energy policy and managing greenhouse gas issues.	Master of Energy Systems
Degree in Engineering (work experience may be required see pg. 6)	Take the next step in your career, with a specialisation in either engineering management or project management.	Master of Engineering Management
Degree in Engineering (work experience may be required see pg. 7)	Discover the principles underpinning sustainable development and gain advanced professional skills in environmental management.	Master of Environmental Engineering

HOW TO STUDY IT AT MELBOURNE

School Leavers

Melbourne Degrees

Bachelor of Science
Majors:
Computing and Software Systems
Data Science
Informatics
Spatial Systems

Bachelor of Design
Majors:
Computing
Digital Technologies
Spatial Systems

IT as breadth
– in any Melbourne degree

Diploma in Informatics
An extra semester to complement your degree.

School Leavers

Other Bachelor Degree
Duration of Graduate Coursework programs will vary from 1.5–3 years depending on the amount of credit obtained from prior study.

3 YEARS

Exit to employment

Graduate Coursework

Master of Engineering
– Spatial
– Mechatronics
– Software
– Software with Business

Master of Information Systems[1]

Master of Information Technology
– Computing
– Distributed
– Spatial

Master of Science
– Computer Science

Master of Data Science

2 YEARS

Exit to employment
as an IT professional, spatial expert or a accredited engineer

Research Higher Degrees
Master of Philosophy (MPhil)
Doctor of Philosophy (PhD)

2–4 YEARS

[1] A specialisation in Health has been proposed for commencement in 2017, pending Academic Board approval. Research options also available.

QUICK REFERENCE GUIDE

WHAT ARE SUBJECT POINTS?

A typical University of Melbourne subject is worth 12.5 points. A full-time load for one year is 100 points, which is usually divided into eight subjects of 12.5 points each, taken over two semesters.

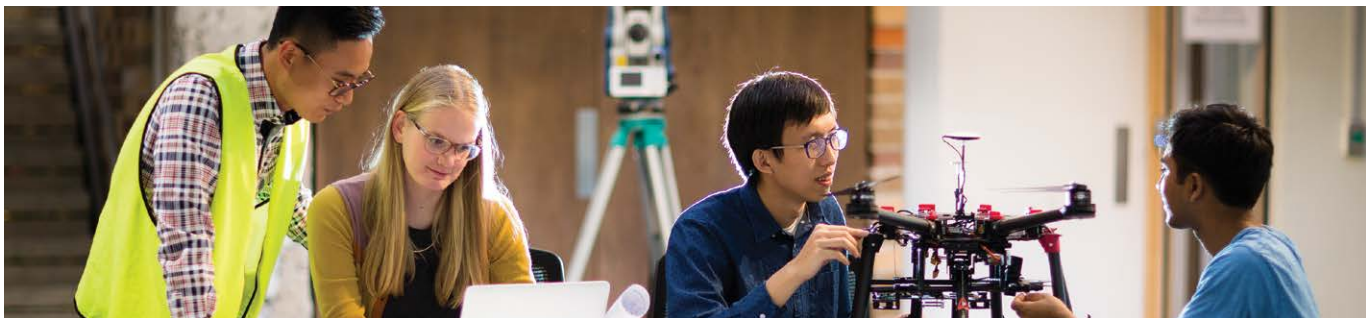
Undergraduate Programs with Engineering & IT Pathways

Minimum Entry Requirements Guideline

Program Name	Australian VCE students	IB Diploma[1]	GCE A Levels	Mode and Duration	Entry	Page No.
Bachelor of Biomedicine	Clearly in rank 2016: 98.30 Minimum ATAR 2016: 96.00 Prerequisites: Units 3 & 4: A study score of at least 25 in English/English Language/Literature or at least 30 in EAL, and at least 25 in Chemistry and in Mathematical Methods (CAS) or Specialist Mathematics.	38 Prerequisites: At least Grade 4 English (SL or HL), Chemistry (SL or HL) and Mathematics (SL or HL)/Further Mathematics.	AAB Prerequisites: Chemistry, Mathematics and at least grade C in an accepted AS or A Level English subject.	Course work: 3 years full-time. Available part-time.	Sem 1	10
Bachelor of Science	Clearly in rank 2016: 85.00 Minimum ATAR 2016: 85.00 Prerequisites: Units 3 & 4: A study score of at least 25 in English/English Language/Literature or at least 30 in EAL, and a study score of at least 25 in Mathematical Methods (CAS) or Specialist Mathematics and in one of Biology, Chemistry or Physics; OR Units 3 & 4: A study score of at least 25 in English/English Language/Literature or at least 30 in EAL, and a study score of at least 25 in both Mathematical Methods (CAS) and Specialist Mathematics.	31 Prerequisites: At least Grade 4 in English (SL or HL), Mathematics (SL or HL)/Further Mathematics and one of Biology (SL or HL), Chemistry (SL or HL) or Physics (SL or HL); OR at least Grade 4 in English (SL or HL), Mathematics (SL or HL) and Further Mathematics.	BCC Prerequisites: Mathematics and one of Biology, Chemistry or Physics, plus at least Grade C in an accepted AS or A Level English subject.	Course work: 3 years full-time. Available part-time.	Sem 1, Sem 2	10
Bachelor of Design	Minimum ATAR 2017: 85.00 Prerequisites: Units 3 & 4: A study score of at least 25 in English/English Language/Literature or at least 30 in EAL. Mathematical knowledge equivalent to a study score of 25 in VCE Mathematical Methods Units 3 and 4 is required for the following majors: Civil Systems, Computing, Digital Technologies, Mechanical Systems, and Spatial Systems.	31 Prerequisites: At least Grade 4 (SL or HL) English. Mathematical knowledge equivalent to a study score of 25 in VCE Mathematical Methods Units 3 and 4.	BCC Prerequisites: At least Grade C in an accepted AS or A Level English subject. Mathematical knowledge equivalent to a study score of 25 in VCE Mathematical Methods Units 3 and 4.	Course work: 3 years full-time. Available part-time.	Sem 1, Sem 2	10

Entry requirement information is provided as a guide only and cannot be guaranteed in 2017. More information is available at coursesearch.unimelb.edu.au

[1] International IB students only. Australian IB students will have their score converted to a notional ATAR.



Graduate Programs

Program Name	Minimum Entry Requirements[1]	Mode, Duration[2] and type of program	Entry	Page No.
COURSEWORK PROGRAMS				
Biomedical Engineering				
Master of Engineering (Biomedical) Accredited by Engineers Australia and EUR-ACE® **Master of Engineering (Biomedical with Business)** Provisionally accredited by Engineers Australia[3]	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and the equivalent of 25 points (2 subjects) of first year Biology, or 25 points of first year Chemistry, or 25 points of first year Physics.	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	14
Chemical and Biochemical Engineering				
Master of Engineering (Biochemical) Accredited by Engineers Australia, EUR-ACE® and IChemE	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year Chemistry (or equivalent).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	16
Master of Engineering (Chemical) Accredited by Engineers Australia, EUR-ACE® and IChemE **Master of Engineering (Chemical with Business)** Accredited by Engineers Australia	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year Chemistry (or equivalent).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	17
Civil and Structural Engineering				
Master of Engineering (Civil) Accredited by Engineers Australia and EUR-ACE® **Master of Engineering (Civil with Business)** Accredited by Engineers Australia	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year science subjects (any).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	19
Master of Engineering (Structural) Accredited by Engineers Australia and EUR-ACE®	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year science subjects (any).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	20
Master of Engineering Structures	A four-year undergraduate degree in Structural or Civil Engineering with a weighted average of at least 65%. In addition, Civil Engineering graduates must have one year of relevant work experience, or 30% of the final year of the degree dedicated to structural engineering subjects.	Coursework: 1 year full-time. Available part-time. A specialised program of professional development for qualified engineers.	Sem 1, Sem 2	22

Program Name	Minimum Entry Requirements[1]	Mode, Duration[2] and type of program	Entry	Page No.
COURSEWORK PROGRAMS				
Electrical and Electronic Engineering				
Master of Engineering (Electrical) Accredited by Engineers Australia and EUR-ACE® **Master of Engineering (Electrical with Business)** Provisionally accredited by Engineers Australia[3]	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year Physics (or equivalent).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	23
Master of Telecommunications Engineering	A four year engineering degree in a related discipline (electrical, communications, computer, information) with a weighted average of at least 65%.	Coursework: 1 year full-time. Available part-time. A specialised program of professional development for qualified engineers.	Sem 1, Sem 2	25
Energy				
Master of Energy Systems	An undergraduate degree in a relevant discipline, such as Commerce, Science or Engineering, with a weighted average of at least 70%, including at least 12.5 points (1 subject) of mathematics, statistics or another quantitative subject at an appropriate level, or equivalent. OR An undergraduate degree in a relevant discipline, such as Commerce, Science or Engineering, with a weighted average of at least 65%, including at least 12.5 points (1 subject) of mathematics, statistics or another quantitative subject at an appropriate level and 2 years of continuous documented work experience in an applicable field, or equivalent.	Coursework: 1.5 year full-time. Available part-time. A specialised program of professional development for career changers.	Sem 1	26
Engineering Management				
Master of Engineering Management	A four-year undergraduate degree in Engineering or an appropriate discipline with a weighted average of at least 65%. OR A three-year undergraduate degree in an appropriate discipline with a weighted average of at least 65% with at least two years of full-time documented and relevant work experience since graduation.	Coursework: 1 year full-time. Available part-time. A specialised program of professional development for qualified engineers.	Sem 1, Sem 2	27
Environmental Engineering				
Master of Engineering (Environmental) Accredited by Engineers Australia and EUR-ACE®	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year science (any).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	28

Program Name	Minimum Entry Requirements[1]	Mode, Duration[2] and type of program	Entry	Page No.
COURSEWORK PROGRAMS				
Environmental Engineering				
Master of Environmental Engineering	A four-year undergraduate degree in Engineering with a weighted average of at least 65%. OR A three-year undergraduate degree in an appropriate discipline with a weighted average of at least 65% and at least two years of full-time, documented and relevant work experience.	Coursework: 1 year full-time. Available part-time. A specialised program of professional development for qualified engineers.	Sem 1, Sem 2	30
Information Technology				
Master of Engineering (Software) Accredited by Engineers Australia and EUR-ACE® **Master of Engineering (Software with Business)** Provisionally accredited by Engineers Australia[3]	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics (any), and 25 points (2 subjects) of computing, computer science, programming (or equivalent).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering and IT profession.	Sem 1, Sem 2	31
Master of Engineering (Spatial) Accredited by Engineers Australia[4] and EUR-ACE®	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics (any) and 25 points (2 subjects) of first year science (any).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the spatial information profession.	Sem 1, Sem 2	33
Master of Information Systems Accredited by Australian Computer Society	An undergraduate degree in any discipline with a weighted average of at least 65%.	Coursework: 1-2 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the IT profession.	Sem 1, Sem 2	35
Master of Information Technology Accredited by Australian Computer Society	Any undergraduate degree, with a weighted average of at least 65% and at least one technical subject focused on computer programming (taken at any year level).	Coursework: 1-2 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the IT profession.	Sem 1, Sem 2	36
Master of Data Science	An undergraduate degree majoring in either computer science, data science or statistics, with a weighted average of at least 65% or equivalent, and a tertiary level 12.5 point subject from computer science or a related discipline with content focussed on computer programming, and the equivalent of 25 points (2 subjects) of first-year mathematics, including Calculus 2 (MAST10006 or equivalent).	Coursework: 2 years full-time. Available part-time. A specialised program of professional development.	Sem 1, Sem 2	38
Master of Science (Computer Science) Research pathway[5] Accredited by Euro-Inf®	An undergraduate degree with a major in computer science, with a weighted average of at least 65% in the major (or equivalent).	Coursework: 2-3 years full-time. Available part-time. Research entry program – suitable for applicants seeking entry to PhD or MPhil.	Sem 1, Sem 2	39

Program Name	Minimum Entry Requirements[1]	Mode, Duration[2] and type of program	Entry	Page No.
COURSEWORK PROGRAMS				
Mechanical Engineering and Mechatronics				
Master of Engineering (Mechanical) Accredited by Engineers Australia and EUR-ACE® **Master of Engineering (Mechanical with Business)** Accredited by Engineers Australia	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year physics (or equivalent).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	41
Master of Engineering (Mechatronics) Accredited by Engineers Australia and EUR-ACE®	An undergraduate degree with a weighted average of at least 65% including the equivalent of 25 points (2 subjects) of first-year mathematics, specifically Calculus 2 and Linear Algebra (or equivalent) and 25 points (2 subjects) of first year physics (or equivalent).	Coursework: 2-3 years full-time. Available part-time. Professional entry program – suitable for applicants seeking entry into the engineering profession.	Sem 1, Sem 2	42
RESEARCH PROGRAMS				
Master of Philosophy – Engineering	A four-year bachelor degree in a relevant discipline which includes a substantial research component equivalent to at least 25% of one year of full-time study and have achieved a minimum weighted average of 75% in the final year subjects or equivalent or A masters degree in a relevant discipline which includes a substantial research component equivalent to at least 25% of one year of full-time study and achieved a minimum weighted average of 75% or equivalent or A qualification and professional experience considered to be equivalent	Research: 1.5 to 2 years full-time. Available part-time.	Sem 1, Sem 2, Flexible	45
PhD	A four-year bachelor degree in a relevant discipline which includes a substantial research component equivalent to at least 25% of one year of full-time study and have achieved a minimum weighted average of 75% in the final year subjects or equivalent or A masters degree in a relevant discipline which includes a substantial research component equivalent to at least 25% of one year of full-time study and achieved a minimum weighted average of 75% or equivalent or A qualification and professional experience considered to be equivalent	Research: 3 years full-time. Available part-time.	Sem 1, Sem 2, Flexible	45

Professional entry programs, for those seeking a professional qualification in engineering or IT.	Specialised programs suitable for qualified engineers and IT specialists, seeking professional development or a change of career.	Research degrees or research pathway degrees.

[1] Minimum entry requirements listed are a guide only and do not guarantee entry into the course. Full entry requirements are available in the University of Melbourne Handbook at handbook.unimelb.edu.au. Required grades listed are calculated as equivalent to University of Melbourne grades. Calculus 2 is a University of Melbourne subject; details at handbook.unimelb.edu.au/view/current/MAST10006 for details. Linear Algebra is a University of Melbourne subject; details at handbook.unimelb.edu.au/view/current/MAST10007.

[2] Advanced standing for students with a first degree or prior study in engineering will be determined upon application. You must supply the subject descriptions of the subjects you have completed from the relevant institution's subject handbook.

[3] This specialisation within the Master of Engineering (with Business) has received provisional accreditation from Engineers Australia. Full accreditation will be granted when sufficient students graduate from the program. Accreditation status will be backdated, so that all graduates receive full accreditation.

[4] Provisionally accredited by Engineers Australia, until sufficient students graduate from the program.

[5] Students who undertake research study within a professional entry program may also be eligible to undertake a research degree.

UNDERGRADUATE PATHWAYS

Engineering via the Bachelor of Biomedicine

Biomedicine is concerned with the processes and systems that create, sustain and threaten life. Graduates of the Bachelor of Biomedicine will play leading roles in providing innovative solutions to health challenges. This pathway into biomedical engineering is ideal for students looking to complement their technical skills with medical knowledge.

Engineering major available:

- Bioengineering Systems

Duration: 3 years full-time

Fee Type: CSP and international fee

Students who have successfully completed the Bachelor of Biomedicine with a Bioengineering Systems major will be eligible for the Master of Engineering (Biomedical), which leads to professional accreditation as an engineer.

Engineering and IT via the Bachelor of Design

The Bachelor of Design is focused on the life-cycle of the constructed and inhabited world. Students wishing to study engineering or IT through this new course will use innovative processes to solve engineering and IT problems creatively, to determine optimal solutions for a better future.

Engineering and IT majors available:

- Civil Systems
- Computing
- Digital Technologies
- Mechanical Systems
- Spatial Systems

Duration: 3 years full-time

Fee Type: CSP and international fee

Students who have successfully completed a Bachelor of Design with an engineering major will be eligible for the Master of Engineering which leads to professional accreditation as an engineer.

Engineering and IT via the Bachelor of Science

The Bachelor of Science is the most flexible option, for students interested in engineering or technology, offering the greatest range of subject and discipline choice. The Bachelor of Science offers engineering and IT specialisations, which will lead to the two year Master of Engineering and professional accreditation as an engineer, or to the Master of Information Technology or Master of Information Systems courses.

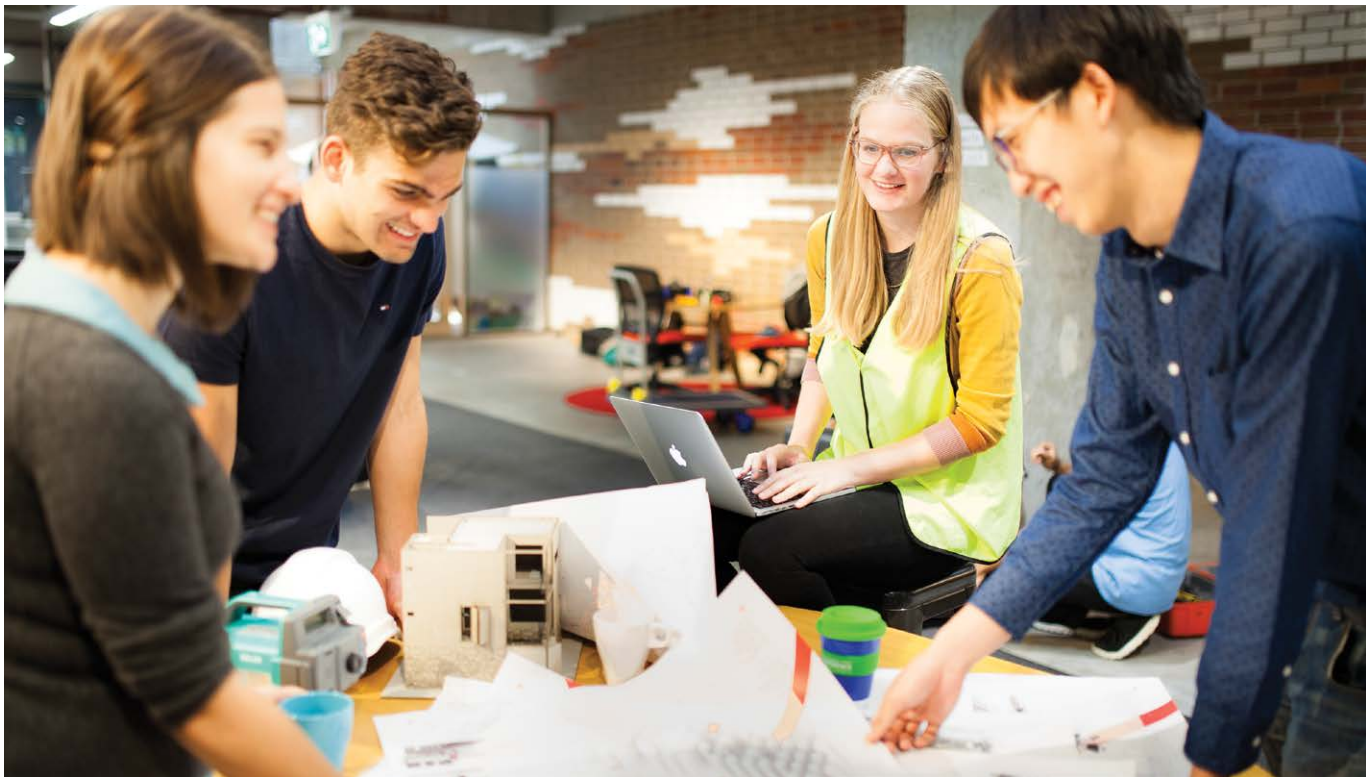
Engineering and IT majors available:

- Bioengineering Systems
- Chemical Systems
- Civil Systems
- Computing and Software Systems
- Data Science
- Electrical Systems
- Informatics
- Mechanical Systems
- Mechatronics Systems
- Spatial Systems

Duration: 3 years full-time

Fee Type: CSP and international fee

Students who have successfully completed a Bachelor of Science with an engineering major will be eligible for the Master of Engineering which leads to professional accreditation as an engineer.



IT via the Diploma in Informatics

Complement your degree with a Diploma in Informatics to equip yourself with the IT knowledge that employers seek.

In this Diploma you will:

- learn tools and technologies to solve information-related problems in a range of application areas
- develop programming skills
- design web-based solutions
- develop the skills necessary to work effectively with people in other disciplines.

Informatics opens up career opportunities in finance, economics, biology, geology, chemistry, engineering, health, communications and social media.

The Diploma adds one semester to a normal three-year degree, allowing you to graduate with a degree and diploma in 3.5 years.

The Diploma in Informatics provides a pathway to the following graduate programs:

- Master of Engineering (Software)
- Master of Engineering (Software with Business)
- Master of Information Systems
- Master of Information Technology in one of the following three streams: Computing; Distributed Computing; and Spatial.
- Master of Science (Bioinformatics)

A competitive edge with informatics

Cornelis Bosua undertook a Diploma in Informatics, while he was studying the Bachelor of Commerce. Today, Cornelis works as a Data Analyst for Australian analytics firm, Quantium.

"Studying the Diploma in Informatics was the best decision for me. It put me ahead of my classmates, when it came time to look for work.

"I would recommend the Diploma in Informatics to anyone considering it, as it will give you a competitive edge in today's workplace."

MASTER OF ENGINEERING

MELBOURNE
#2
most student-friendly city

QS Best Student City Rankings, 2016

Technical and 'with business' options

The professional Master of Engineering offers an accredited engineering qualification for graduates seeking entry into the engineering profession, in the following 11 technical specialisations: Biomedical, Biochemical, Chemical, Civil, Electrical, Environmental, Spatial, Mechanical, Mechatronics, Software and Structural Engineering and six 'with business' specialisations in Biomedical, Chemical, Civil, Electrical, Mechanical and Software Engineering.

Students who undertake the Master of Engineering (with Business) replace five advanced technical electives with five business subjects that have been tailored specifically for engineering students and co-developed with Melbourne Business School.

The Master of Engineering will suit:

- Graduates of the University of Melbourne with an appropriate Engineering Systems major.
- Holders of an undergraduate degree from any university with the appropriate maths and science background.
- Engineers wishing to upgrade their skills and knowledge or make a career change.

The Master of Engineering offers you:

- An advanced program with 11 technical and 6 'with business' specialisations
- Dual accreditation for professional recognition around the world – the first postgraduate engineering course in Australia to be awarded European accreditation through EUR-ACE®, as well as being accredited by Engineers Australia, which provides international recognition in 17 countries around the world.
- A curriculum, developed in consultation with industry and exposure to industry through lectures, industry projects and competitive entry to a 25 point Industry Based Learning subject.
- Practical experiences through hands-on workshops, design projects, field trips and site visits.
- Cutting-edge research projects with and world-class researchers.
- Professional skills development including team work and communication.
- A generous scholarship program for local and international students.

Master of Engineering – advanced standing and duration

The Master of Engineering is a two to three year program depending upon your academic background. The first 100 points (one year) is made up of foundation study tailored to students from non-engineering backgrounds. Students with some prior study in engineering, or those with an engineering degree seeking to change engineering disciplines, may be eligible for advanced standing of up to 100 points and will complete the Master of Engineering in two years. Students can meet this requirement either by completion of a prescribed University of Melbourne engineering systems major within a Bachelor of Biomedicine, Bachelor of Science or Bachelor of Design, or via an equivalent study of engineering from another institution that is approved by the Melbourne School of Engineering.

Sample plan: Master of Engineering (Chemical with Business)[1]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Engineering Practice and Communication	Material and Energy Balances	Engineering Mathematics	Chemistry: Reactions and Synthesis
Sem 2	Transport Processes	Chemical Process Analysis	Fluid Mechanics	Process Dynamics and Control

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Reactor Engineering	Heat and Mass Transport Processes	Bioprocess Engineering	Economic Analysis for Engineers
Sem 2	Marketing Management for Engineers	Safety, Environment and Design	Chemical Engineering Research Project OR Industry Project	
Sem 1	Process Equipment Design	Process Engineering	Particle Mechanics and Processing	World of Engineering Management
Sem 2	Chemical Engineering Design Project		Engineering Contracts and Procurement	Strategy Execution for Engineers

[1] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

Justin is engineering his career 'with Business'

Final year Master of Engineering (Chemical with Business) student Justin Moscatelli understands that today's engineers are expected to work on the business side of their companies, as well as the technical.

"I jumped at the opportunity to study subjects that would allow me to build my professional and business skills along with studying the technical engineering subjects that I've been enjoying throughout my university years."

Justin says that combining a business mindset to technical engineering projects will give him an advantage in the work force.

"As a graduate, with a grounding in financial, marketing and economic principles, I will be able to work more efficiently in any organisation, and also have a greater understanding of how businesses work, their management, and the costs associated with projects."

With the right mix of technical and business skills to prepare, Justin is planning a career in the chemical engineering industry, where he plans to focus on ways to create a more sustainable energy future.

"I want a career where I can work towards finding solutions to global issues like the growing demand for energy, climate change mitigation and reducing CO2 emissions."

Justin Moscatelli
Master of Engineering
(Chemical with Business)

SCAN THIS IMAGE WITH LAYAR APP

BIOMEDICAL ENGINEERING

Biomedical Engineering has enormous potential to make a positive impact on human health. Biomedical engineers address healthcare problems from a unique perspective, blending an understanding of biomedical science with specialist knowledge of engineering techniques and problem-solving skills.

#1
in Australia,
#18 in the world for
Engineering and
Technology

QS World University
Rankings by
Faculty 2015

Courses in Biomedical Engineering

- Master of Engineering (Biomedical)
- Master of Engineering (Biomedical with Business)

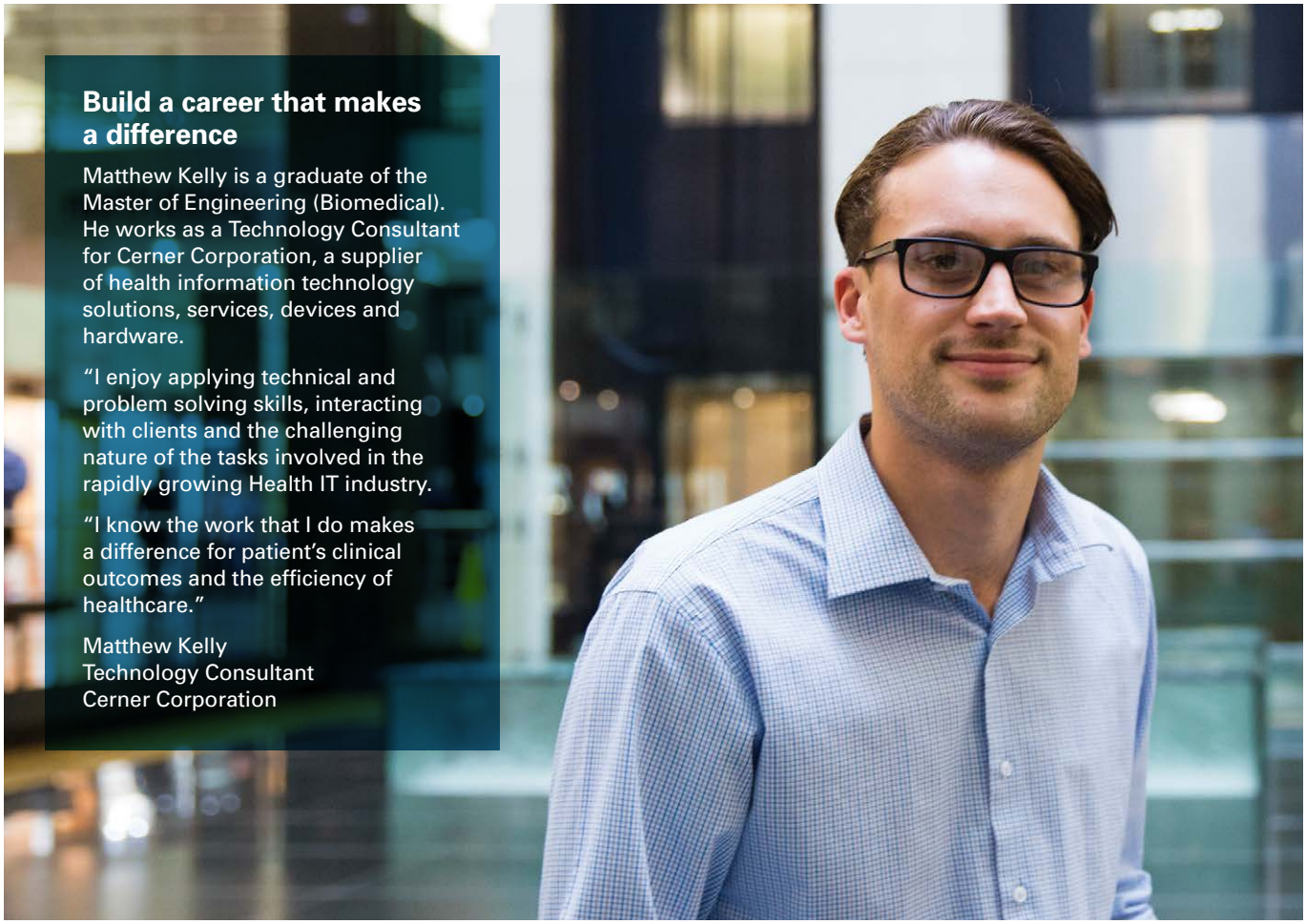
Master of Engineering (Biomedical) or (Biomedical with Business)

You will focus on human systems, the design and operation of devices and processes, and the application of engineering skills to new medical treatments, instruments and machines. Our reputation for biomedical innovation in areas such as medical bionics and targeted drug delivery systems, ensures you are learning from leaders in the field, who are working on exciting projects aimed at solving major health dilemmas.

These professional entry level courses will lead to a formal qualification in biomedical engineering.

Career Outcomes

Biomedical engineers develop new drug therapies, study the electrical and mechanical activity of organs such as the brain, heart and muscle, build artificial organs, limbs, heart valves and bionic implants to replace lost function, and grow living tissues to replace failing organs. You can expect to work in the biotechnology, biomedical, pharmaceutical, medical device and equipment industries, in research and innovation, in the health services and hospitals, in government and consulting, and for companies such as Cochlear, Sanofi, Cell Therapies, Compumedics and GlaxoSmithKline.



Build a career that makes a difference

Matthew Kelly is a graduate of the Master of Engineering (Biomedical). He works as a Technology Consultant for Cerner Corporation, a supplier of health information technology solutions, services, devices and hardware.

"I enjoy applying technical and problem solving skills, interacting with clients and the challenging nature of the tasks involved in the rapidly growing Health IT industry.

"I know the work that I do makes a difference for patient's clinical outcomes and the efficiency of healthcare."

Matthew Kelly
Technology Consultant
Cerner Corporation

Studying Biomedical Engineering in your undergraduate degree

Sample plan: Bachelor of Biomedicine with a major in Bioengineering Systems[1,2]

Year 1	Sem 1	Chemistry for Biomedicine	Calculus 2	Biomolecules and Cells	Breadth
Year 1	Sem 2	Engineering Systems Design 2	Linear Algebra	Genes and Environment	Breadth
Year 2	Sem 1	Engineering Mathematics	Molecular and Cellular Biomedicine		Breadth
Year 2	Sem 2	Biomechanical Physics and Computation	Human Structure and Function		Breadth
Year 3	Sem 1	Introduction to Biomechanics	Circuits and Systems	Biomedicine: Molecule to Malady	Breadth
Year 3	Sem 2	Biotransport Processes	Biosystems Design	Frontiers in Biomedicine	Breadth

Studying Biomedical Engineering in your graduate degree

Sample plan: Master of Engineering (Biomedical)[2,3]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Introduction to Biomechanics	Circuits and Systems	Biomechanical Physics and Computation	Engineering Practice and Communication
Sem 2	Biosystems Design	Biotransport Processes	Engineering Mathematics	Biomedical Science elective

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Clinical Trials and Regulations	Electrical Network Analysis and Design	Bioengineering elective	Bioengineering elective
Sem 2	Biomaterials	Anatomy and Physiology for Engineers	Bioengineering elective	Bioengineering elective
Sem 1	Biomedical Engineering Capstone subject	Biosystems Modelling	Biomedical Engineering Management	Approved elective
Sem 2		Biomedical Engineering Design Project		Approved elective

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

[3] Master of Engineering (Biomedical with Business) students will replace five electives with five business subjects.

CHEMICAL AND BIOCHEMICAL ENGINEERING

#27
in the world
for Chemical
Engineering

QS World University
Rankings by
Subject 2016

Chemical and Biochemical Engineering is unlocking solutions to the most pressing problems the world is facing in relation to energy, food, water and environmental remediation.

Courses in Chemical and Biochemical Engineering

- Master of Engineering (Biochemical)
- Master of Engineering (Chemical)
- Master of Engineering (Chemical with Business)

Master of Engineering (Biochemical)

You will design novel bioproducts and bioprocesses that will have applications in food and beverage engineering, production of pharmaceuticals and cosmetics, and environmental remediation.

You will benefit from interaction with industry representatives and work on a design or research project, which may take the form of an industrial placement.

This professional-entry-level course will lead to a formal qualification in biochemical engineering.

Career Outcomes

This course will prepare you to enter a variety of industries including: food and beverage processing; pharmaceutical manufacture; cosmetics; biological waste treatment and bioremediation.

Biochemical engineering graduates can find employment with companies, such as CSL Limited, GlaxoSmithKline (GSK), National Foods, Nestlé, Mondelēz International and Melbourne Water and with organisations such as the Environmental Protection Authority (EPA).

Open a pathway to niche industries

In his first year of the Master of Engineering (Biochemical) Nicholas Buttigieg has already had the opportunity to explore biochemical engineering beyond the lecture theatre. He has been on site tours to Siemens, CSIRO and GSK, and has done vacation work in the dairy industry for Dairy Innovation Australia Ltd (DIAL).

"Biochemical engineering excites me, because it can provide pathways to niche industries, such as food, water and pharmaceuticals – all vital elements of everyday life."

Nicholas Adrian Buttigieg
Master of Engineering (Biochemical)

Master of Engineering (Chemical) or (Chemical with Business)

Chemical engineers invent, design and implement processes through which raw materials are converted into valuable products, such as petrol, plastics, food additives, fertilisers, paper and pharmaceuticals. These programs promote the development of practical, laboratory-based skills, combined with expertise in computing and simulation.

You will develop expertise under the guidance of staff known internationally for their research in areas, such as nanotechnology, carbon capture and storage, minerals and materials, natural gas processing and solvent extraction. You will have the opportunity to complete an industry project in conjunction with a relevant industry partner. These professional entry level courses will lead to a formal qualification in chemical engineering.

Career Outcomes

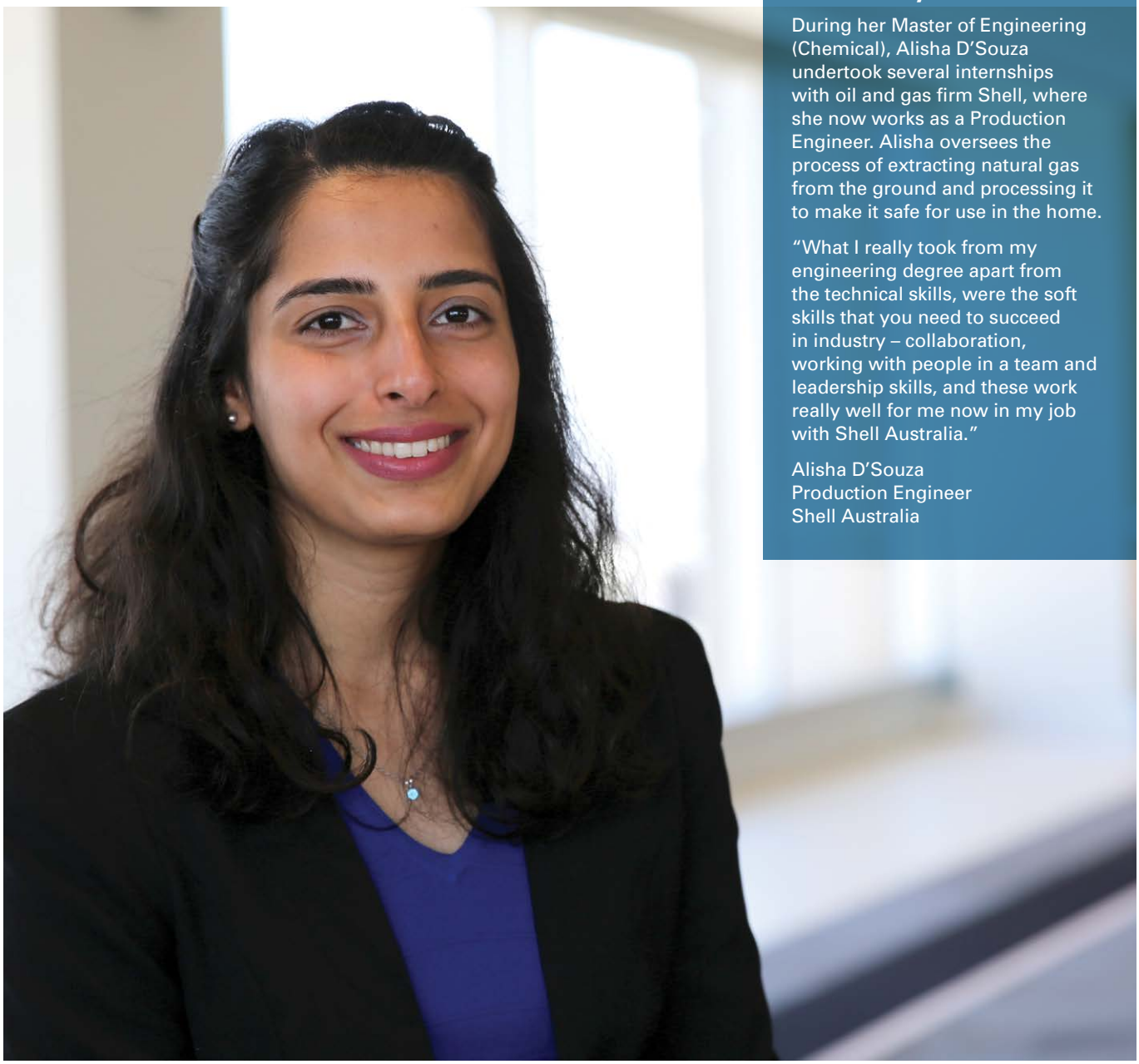
Career opportunities in chemical engineering are extensive and exist in petrochemical, minerals processing, mining, chemical manufacturing, natural gas, explosives and fertiliser production and environmental consulting. Our graduates are employed in a diverse range of industries, for companies including: ExxonMobil, BP, PETRONAS, Schlumberger, Nyrstar, BHP Billiton, Rio Tinto, Worley Parsons, Uhde Shedden, WSP Parsons Brinckerhoff, Wood Group PSN, GHD, AECOM, Mars and Unilever.

Develop crucial soft skills for industry success

During her Master of Engineering (Chemical), Alisha D'Souza undertook several internships with oil and gas firm Shell, where she now works as a Production Engineer. Alisha oversees the process of extracting natural gas from the ground and processing it to make it safe for use in the home.

"What I really took from my engineering degree apart from the technical skills, were the soft skills that you need to succeed in industry – collaboration, working with people in a team and leadership skills, and these work really well for me now in my job with Shell Australia."

Alisha D'Souza
Production Engineer
Shell Australia



Studying Chemical Engineering in your undergraduate degree

Sample plan: Bachelor of Science with a major in Chemical Systems[1,2]

Year 1	Sem 1	Engineering Systems Design 1	Calculus 2	Chemistry 1	Breadth or Science elective
Year 1	Sem 2	Engineering Systems Design 2	Linear Algebra	Chemistry 2	Breadth or Science elective
Year 2	Sem 1	Material and Energy Balances	Chemistry: Reactions and Synthesis	Science elective	Breadth
Year 2	Sem 2	Chemical Process Analysis	Transport Processes	Engineering Mathematics	Breadth
Year 3	Sem 1	Reactor Engineering	Heat and Mass Transport Processes	Science elective	Breadth
Year 3	Sem 2	Fluid Mechanics	Process Engineering Case Studies	Science elective	Breadth

Studying Biochemical Engineering in your graduate degree

Sample plan: Master of Engineering (Biochemical)[2,3]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Material and Energy Balances	Engineering Mathematics	Chemistry: Reactions and Synthesis	Reactor Engineering
Sem 2	Transport Processes	Chemical Process Analysis	Fluid Mechanics	Heat and Mass Transport Processes

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Engineering Practice and Communication	Biochemical Engineering elective	Bioprocess Engineering	Chemical Engineering Management
Sem 2	Biochemical and Pharmaceutical Engineering	Safety, Environment and Design	Process Dynamics and Control	Biochemical Engineering elective
Sem 1	Food Engineering	Process Equipment Design	Process Engineering	Particle Mechanics and Processing
Sem 2	Biochemical Engineering Design Project		Biochemical Engineering Research Project or Industry Project	

Studying Chemical Engineering in your graduate degree

Sample plan: Master of Engineering (Chemical)[2,3]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Reactor Engineering	Material and Energy Balances	Engineering Mathematics	Chemistry: Reactions and Synthesis
Sem 2	Transport Processes	Chemical Process Analysis	Fluid Mechanics	Heat and Mass Transport Processes

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Engineering Practice and Communication	Chemical Engineering elective	Bioprocess Engineering	Chemical Engineering Management
Sem 2	Advanced Thermo and Reactor Engineering	Safety, Environment and Design	Process Dynamics and Control	Chemical Engineering elective
Sem 1	Process Equipment Design	Process Engineering	Advanced Heat and Mass Transport	Particle Mechanics and Processing
Sem 2	Chemical Engineering Design Project		Chemical Engineering Research Project or Industry Project	

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

[3] Master of Engineering (Chemical with Business) students will replace two electives and three other subjects with five business subjects.

CIVIL AND STRUCTURAL ENGINEERING

#29
in the world for Civil and Structural Engineering

QS World University Rankings by Subject 2016

Civil and structural engineers plan, design and construct the built environment, providing essential services and infrastructure. Civil and structural engineers have a huge impact on the world, from restoring infrastructure after natural disasters to building structures that can withstand extreme events.

Courses in Civil and Structural Engineering

- Master of Engineering (Civil)
- Master of Engineering (Civil with Business)
- Master of Engineering (Structural)
- Master of Engineering Structures

Master of Engineering (Civil) or (Civil with Business)

These professional-entry-level courses will lead to a formal qualification in civil engineering and cover many facets of civil engineering including sustainable urban developments, environmental protection, the conservation of energy and water resources, as well as the traditional disciplines of structural, geotechnical, hydraulic and transportation engineering. The program is led by an internationally recognised team of academics and is designed to produce a broader and deeper approach to civil engineering by incorporating extra education in sustainability design and environmental processes.

Career Outcomes

As a civil engineer you could design and create a range of solutions, in areas ranging from sustainable urban development, environmental protection, conservation of energy and water resources, to geotechnical, hydraulic or transport engineering. Career opportunities exist in construction, property, infrastructure, consulting, mining, land, water and waste, for a wide range of organisations including manufacturing companies, research organisations, academic institutions, mining companies, energy agencies, local, state and federal governments and local authorities. Equipped with a diverse skill set across a range of areas, you will be highly employable and have opportunities to work both locally and internationally with companies, such as John Holland, Jacobs, Aurecon, Brookfield Multiplex, CPB Contractors and many others.

Construct a real-world career

Master of Engineering (Civil) graduate William Thay chose to make the switch to engineering, after studying and working in pharmacy.

"I wanted to become an engineer because the world is on the brink of great change, where the expertise of engineers will be needed to make life more sustainable."

William became interested in construction, during some projects he worked on, while at university.

"I found the projects and assignments were very practical and a lot of things we worked on were actually happening in industry. I worked on a project that the City of Melbourne were also working on, providing me with invaluable real-world insight into project management."

William has now secured a role in construction management with national construction company ProBuild.

William Thay
Construction Management Graduate
ProBuild

Master of Engineering (Structural)

Structural engineers apply mathematical and scientific principles to design and evaluate materials and systems used in building load-bearing structures such as roads, buildings, railway lines, dams and bridges. You will be guided by researchers, who are recognised internationally for their expertise in high-rise structures, and earthquake and blast-resistant technologies. You will have access to some highly specialised subjects in structural engineering, including the design of resilient structures to counter extreme conditions. Design seminars, field work and workshops provide opportunities to work with industry professionals.

This professional-entry-level course will lead to a formal qualification in structural engineering.

Career Outcomes

Career opportunities exist in a variety of roles related to the design and development of structures, their longevity, and their ability to withstand extremes, such as earthquake, high winds, blast or fire, and the risk assessment of infrastructure, for government, consultancies and industry. You will find employment with national and global companies such as Arup, Bonacci Group, Brookfield Multiplex, GHD, WorleyParsons and AECOM.

Broaden your options with further study

Minhtri Nguyen studied a Master of Engineering (Structural) after completing a first degree in architecture.

"I chose to study at the University of Melbourne because engineering was offered as a postgraduate degree. This gave me the best opportunity to broaden my education, and open up new career options, rather than having to start all over again."

Today, Minhtri works as a structural engineer for engineering design consultancy company Bonacci Group.

"It is a solutions driven job that facilitates the design and viability of building construction projects, while delivering a high quality service to our clients. I enjoy the mental challenge and the opportunity to keep developing in an industry that excites me."

Minhtri Nguyen
Structural Engineer
Bonacci Group

Studying Civil Engineering in your undergraduate degree

Sample plan: Bachelor of Design with a major in Civil Systems[1,2]

Year 1	Sem 1	Calculus 2	Physics 1 or Physics 1: Fundamentals	Elective	Breadth
Year 1	Sem 2	Linear Algebra	Statics	Elective	Breadth
Year 2	Sem 1	Engineering Mechanics	Engineering Mathematics	Elective	Breadth
Year 2	Sem 2	Engineering Materials	Earth Processes for Engineering	Elective	Breadth
Year 3	Sem 1	Fluid Mechanics	Engineering Risk Analysis	Elective	Breadth / Elective
Year 3	Sem 2	Systems Modelling and Design	Structural Theory and Design	Elective	Breadth / Elective

Studying Civil Engineering in your graduate degree

Sample plan: Master of Engineering (Civil)[2,3]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Engineering Practice and Communication	Engineering Mechanics	Engineering Mathematics	Fluid Mechanics
Sem 2	Earth Processes for Engineering	Engineering Materials	Systems Modelling and Design	Structural Theory and Design

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Structural Theory and Design 2	Sustainable Infrastructure Engineering	Engineering Site Characterisation	Geotechnical Engineering
Sem 2	Engineering Project Implementation	Civil Hydraulics	Transport Systems	Civil Engineering elective
Sem 1	IE Research Project 1	Risk Analysis	Integrated Design (Civil)	Civil Engineering elective
Sem 2		Construction Engineering	Civil Engineering elective	Civil Engineering elective

Studying Structural Engineering in your graduate degree

Sample plan: Master of Engineering (Structural)[2,3]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Engineering Practice and Communication	Engineering Mechanics	Fluid Mechanics	Engineering Risk Analysis
Sem 2	Earth Processes for Engineering	Engineering Materials	Structural Theory and Design	Engineering Mathematics

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Structural Theory and Design 2	Sustainable Infrastructure Engineering	Engineering Site Characterisation	Structural Engineering elective
Sem 2	Engineering Project Implementation	Structural Theory and Design 3	Systems Modelling and Design	Structural Engineering elective
Sem 1	IE Research Project 1	Geotechnical Engineering	Structural Engineering elective	Structural Engineering elective
Sem 2		Construction Engineering	Integrated Design (Infrastructure)	Structural Engineering elective

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006.

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

[3] Master of Engineering (Civil with Business) students will replace five electives with five business subjects.

Master of Engineering Structures

The Master of Engineering Structures provides a unique opportunity for both graduate and experienced civil and structural engineers to learn from internationally recognised experts in structural engineering. You will further your knowledge in the advanced design of engineering structures, in particular, the design of ecologically sustainable and resilient structures. You will gain a thorough understanding of structural systems, conceptual design and advanced analysis techniques and have access to a dynamic mix of guest and local seminar presentations on leading research topics. This program will suit qualified engineers wanting to upskill, change their career, or extend their current knowledge of structural engineering.

Career Outcomes

Career opportunities exist in a variety of roles related to the design of structures, their longevity, and their ability to withstand extreme conditions, such as earthquakes, high winds, explosions, fire and other high impact loads.

In addition to designing, building and assessing new structures, you may be involved in the risk assessment of existing structures. Your advanced knowledge of the theory and practice of structural engineering will be an asset in industry, enhancing your technical, management and leadership skills. You will find employment with national and global companies such as Arup, AECOM, Bonacci Group, Hyder Consulting, Cardno and Beca.

Course Structure

Students will complete a one year (100 point) full-time (or part-time equivalent) program, consisting of eight subjects of 12.5 points each. Students take two core subjects (25 points), a minimum of three structural engineering electives (37.5 points), and up to three infrastructure engineering electives (37.5 points).

Core subjects

- High Rise Structures
- Structural Theory and Design 3

Structural Engineering electives

- Earthquake Resistant Design of Buildings
- Extreme Loading of Structures
- Concrete Design and Technology
- Structural Dynamics and Modelling

Infrastructure Engineering electives

- Sustainable Infrastructure Engineering
- Quantitative Environmental Modelling
- Solar Energy
- Energy for Sustainable Development
- Project Management Practices
- Engineering Project Implementation
- Geotechnical Applications
- Building Information Modelling
- Energy Efficiency Technology
- Sustainable Buildings
- Engineering Contracts and Procurement
- IE Research Project 1
- IE Research Project 2
- IE Research Project 3

Please note: subjects offered may change from year to year. Refer to University Handbook for up-to-date subject listings at: handbook.unimelb.edu.au/view/current/746ST

Challenge yourself every day

Rinay Singh chose to return to the University of Melbourne to do further study in structural engineering.

"I just wanted to go to the best university in Australia and learn from the best lecturers and tutors, and it has paid off."

The knowledge Rinay gained from the Master of Engineering Structures impressed the senior engineers at international construction consulting company Cardno, where he now works as a structural engineer.

"I did the masters course because I wanted to learn key aspects of structural engineering, things that many engineers would not know about, such as earthquake design and explosive design."

Rinay particularly enjoys working on difficult problems at work.

"Everyday is different and everyday is challenging. It is very satisfying solving challenges and hurdles, or coming up with solutions that no one has thought of."

Rinay Singh
Structural Engineer
Cardno

ELECTRICAL AND ELECTRONIC ENGINEERING

#1 in Australia for Electrical Engineering

QS World University Rankings by Subject 2016

Electrical and Electronic Engineering is an important driver of innovation in the 21st century. Our electrical and electronic engineering experts are working on a range of ground breaking projects from developing bionic implants and creating models and devices to better understand and treat diseases, such as autism and epilepsy, to creating energy efficient telecommunication systems and deploying sensor networks to monitor and manage the environment.

Courses in Electrical and Electronic Engineering

- Master of Engineering (Electrical)
- Master of Engineering (Electrical with Business)
- Master of Telecommunications Engineering

Master of Engineering (Electrical) or (Electrical with Business)

Electrical engineers play a key role in the design, implementation and management of systems that exploit electrical phenomena to solve practical problems, such as systems for automation, surveillance, energy conversion, power distribution, telecommunications and information processing. You will develop technical skills through fundamental theory and practical laboratory work, learning from leading experts, who work in partnership with organisations such as IBM and Alcatel-Lucent's Bell Labs. You will have the opportunity to take part in a research project in electronic and photonic system design, telecommunications, power networks, signal processing and automatic control systems. These professional-entry-level courses will lead to a formal qualification in electrical engineering.

Career Outcomes

Career opportunities exist as technical specialists and managers in fields such as the power industry, telecommunications, electronics, biotechnology, manufacturing, automation, transport, defence and the computer industry, as well as roles in research and innovation. You will find employment with companies such as Telstra, Siemens, Airbus Group Australia Pacific, BHP Billiton, Chevron, Alcoa, Compumedics and Cochlear Ltd.

Accelerate your own startup

Since completing a Master of Engineering (Electrical) and a stint with the Melbourne Accelerator Program (MAP), David Mah has gone on to launch two business startups. He is co-founder of the highly successful retail app Bluesky; the most popular mobile catalogue shopping app in Australia. His more recent startup venture, Kepler Analytics, is a real-time analytics tool for customer behaviour in bricks and mortar stores. He attributes his time as an engineering and MAP student as pivotal to his success.

"The University of Melbourne was a top choice for me to study electrical engineering, because of its positive culture and highly innovative environment. Looking back, I don't think I would have considered my own startup company, if it were not for my experience studying at Melbourne and my involvement with the Melbourne Accelerator Program."

SCAN THIS IMAGE WITH LAYAR APP

Studying Electrical and Electronic Engineering in your undergraduate degree

Sample plan: Bachelor of Science with a major in Electrical Systems[1,2]

Year 1	Sem 1	Engineering Systems Design 1	Calculus 2	Physics 1	Breadth
Year 1	Sem 2	Engineering Systems Design 2	Linear Algebra	Physics 2: Physical Science and Technology	Breadth
Year 2	Sem 1	Engineering Computation	Engineering Mathematics	Science elective	Breadth
Year 2	Sem 2	Foundations of Electrical Networks	Engineering Mechanics	Science elective	Breadth
Year 3	Sem 1	Digital Systems Design	Electrical Network Analysis and Design	Science elective	Breadth
Year 3	Sem 2	Electrical Device Modelling	Signals and Systems	Science elective	Breadth

Studying Electrical and Electronic Engineering in your graduate degree

Sample plan: Master of Engineering (Electrical)[2,3]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Foundations of Electrical Networks (taken in summer semester)[4]	Engineering Practice and Communication	Electrical Network Analysis and Design	Digital System Design
Sem 2	Engineering Mathematics	Engineering Computation	Electrical Device Modelling	Signals and Systems

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Probability and Random Models	Control Systems	Electronic Circuit Design	Approved elective
Sem 2	Communication Systems	Signal Processing	Embedded System Design	Electronic System Implementation
Sem 1	Electrical Engineering Capstone Project	Electrical Engineering elective	Electrical Engineering elective	Approved elective
Sem 2		Electrical Engineering elective	Electrical Engineering elective	Approved elective

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

[3] Master of Engineering (Electrical with Business) students will replace five electives with five business subjects.

[4] Semester one commencing students, who are not eligible for advanced standing towards Foundations of Electrical Networks will be required to take this subject in summer semester, prior to commencement of semester one.

Master of Telecommunications Engineering

Telecommunications engineers design, build and manage systems that transmit, process and store information as electrical or optical signals. This program enables engineering graduates to develop the competitive technological skills needed in the design and engineering of modern telecommunications systems and networks. You will develop advanced design and analytical skills, as well as a broad understanding of telecommunications networks. You will learn from leading industry professionals and influencers in telecommunications in Australia and worldwide. This program will suit qualified engineers wanting to upskill, change their career, or extend their current knowledge of telecommunications engineering.

Career Outcomes

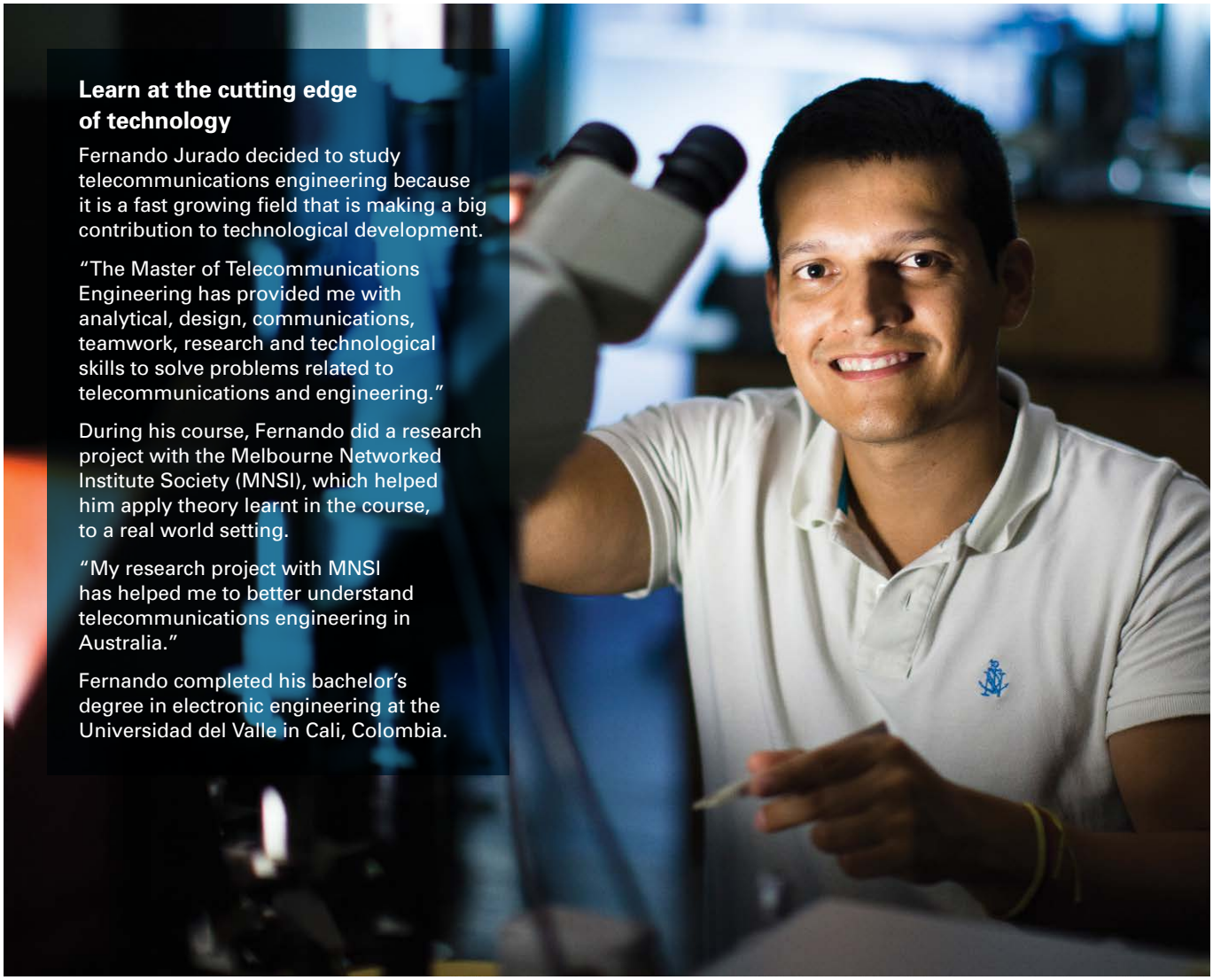
The program will provide you with the skills and specialist knowledge required for a career in the modern telecommunications industry. Career opportunities exist in the design and development of emerging communications technology, digital communications and signal processing, wireless systems and the development of telecommunications hardware and software. Your skills will be in demand in Australia and overseas, working for telecommunications companies such as Telstra, Siemens, Ericsson and Nokia.

Course Structure

You will complete a one year (100 point) full-time (or part-time equivalent) program, consisting of a choice of eight subjects of 12.5 points each. Up to eight subjects can be selected from Master of Telecommunications Engineering electives, at least two of which must be chosen from the subjects marked with an asterisk*.

- Network Design and Optimisation*
- Signalling and Network Management*
- Directed Studies*
- Mobile and Wireless Networks and Design*
- Broadband Access Networking and Design*
- Optical Networking and Design*
- Multimedia Content Delivery*
- Internet Engineering
- Wireless Communication Systems
- Lightwave Systems
- Advanced Communication Systems
- Business of Telecommunications

Please note: subjects offered may change from year to year. Refer to University Handbook for up-to-date subject listings at: handbook.unimelb.edu.au/view/current/364AA



Learn at the cutting edge of technology

Fernando Jurado decided to study telecommunications engineering because it is a fast growing field that is making a big contribution to technological development.

"The Master of Telecommunications Engineering has provided me with analytical, design, communications, teamwork, research and technological skills to solve problems related to telecommunications and engineering."

During his course, Fernando did a research project with the Melbourne Networked Institute Society (MNSI), which helped him apply theory learnt in the course, to a real world setting.

"My research project with MNSI has helped me to better understand telecommunications engineering in Australia."

Fernando completed his bachelor's degree in electronic engineering at the Universidad del Valle in Cali, Colombia.

ENERGY

The Master of Energy Systems brings together engineers, scientists and specialists in economics, finance and energy systems to provide a unique course that will prepare you for a role in the energy sector.

Master of Energy Systems

This course has been developed in close consultation with industry. It is strongly supported by an Industry Advisory Panel that includes senior representatives from industry and government, ensuring that students benefit from a relevant program, internship opportunities and contact with future employers. You will learn from specialists in renewable, thermal and nuclear energy and transport. You will acquire the skills to make informed decisions that incorporate technical, economic, environmental and social considerations. This program will suit graduates of engineering, science, business, finance and economics, looking to make a career change to the energy sector.

Career Outcomes

The global energy sector needs more qualified experts to manage how we source, store, transport and use energy.

You will develop skills in:

- Analysing energy systems from technical, commercial and policy standpoints
- Energy finance, economics and energy markets
- The operation of renewable and non-renewable energy systems
- Auditing different types of energy systems, including carbon emissions
- Combining technical and commercial knowledge to guide business decision-making.

You will find employment in industry and government in the following areas:

- Evaluating the technical and economic performance of energy systems
- Energy-related investment decisions
- Policy development and implementation
- Greenhouse gas and pollutant reporting, regulation and compliance.

Course Structure

You will complete a one-and-a-half year (150 point) full-time (or part-time equivalent) program, comprising eight compulsory core subjects and three electives.

Core Subjects

- Introduction to Energy Systems
- Analysing Energy Systems
- Managerial Economics
- Financial Management
- Non-Renewable Energy
- Renewable Energy
- Energy Supply and Value Chains
- Electrical Power Systems

Elective subjects

- Sustainability Accounting
- Climate Change Politics and Policy
- Environmental Policy Instruments
- Sustainable Buildings
- Solar Energy
- Climate Modelling and Climate Change
- Energy Systems Project (with possible internship – 25 points)*
- Energy Regulation and the Law**
- Business Analysis and Decision Making
- Transport Systems
- Optimisation for Industry
- Engineering Contracts and Procurement
- Freight Systems

*with approval from the academic course coordinator (an average of 75% in preceding subjects is required)

**with approval from the Law Faculty

Preferred course plans are available from the University Handbook at: handbook.unimelb.edu.au/view/current/MC-ENGYSYS. Other subjects may be taken with the approval of the program coordinator.

Become an energy expert

While studying the Master of Energy Systems, Leesa Blazely took on a student vacation role at the Australian Energy Market Operator. This role morphed into a full-time position, upon completion of her degree, where she worked for one year, before being headhunted by energy management technology startup carbonTRACK.

"I'm seen as the energy expert at work, which is great."

Leesa manages a team of staff at carbonTRACK, who are involved in everything from technology installations and technical support, to customer service and energy analysis for their customers.

"The energy industry is on the precipice of massive change. There's a lot of disruption going on, with batteries, the expansion of solar and decentralised energy. It's a very exciting time to be in the energy industry."

Leesa Blazely
Operations Manager
carbonTRACK

ENGINEERING MANAGEMENT

Take the next step in your engineering career with the Master of Engineering Management, to unlock your career potential in both technical and general management positions. You will enhance your technological problem-solving skills, as well as the business skills to manage people, projects and resources in complex organisational settings.

The Master of Engineering (Change Management) will suit engineers, who wish to fast-track their careers into managerial roles in a wide variety of settings. You will understand the legal, commercial, marketing and personnel issues that a manager encounters within a technical environment.

The Master of Engineering (Project Management) will suit engineers, who have a specific interest in developing advanced project management skills in managerial roles. You will understand the theory and practice of project management, including project procurement, team leadership, risk management, communication, financial management and human resources.

Career outcomes

Engineering managers lead engineering projects and personnel, in a range of technical fields such as product development, manufacturing, construction, design engineering, industrial engineering, software engineering and telecommunications. Your career opportunities will be varied and the skills you develop will be in high demand. Our graduates work in management or consultancy roles in areas such as general management, project management, human resources, finance, quality assurance, education, contract arbitration and policy development within technically-focused organisations.

Course Structure

Students will complete a one year (100 point) full-time (or part-time equivalent) program.

The Master of Engineering Management has been developed in conjunction with Melbourne Business School to offer broader business study opportunities to our students, regardless of their level of work experience.

Core Subjects – 12.5 points

All students will complete the following Engineering Capstone Project:

- Engineering Investment Strategy

Elective Subjects – less than two years work experience – 37.5 points

Students with less than two years of work experience must select three electives from the below list:

- Supply Chain Management
- Management Competencies
- Accounting for Decision Making
- Business Analysis and Decision Making
- Financial Management
- Managerial Economics

And the following capstone subject – 12.5

- Strategic Management

Elective Subjects – more than two years work experience

Students with more than two years of work experience may select three electives from the following MBA subjects:

- Financial Management
- Operations
- Data Analysis
- Managing People
- Financial Accounting
- Managerial Economics

And the following capstone subject – 12.5

- Integrative Business Capstone

Change Management Stream – 37.5 points

Students must complete three subjects including at least two of the following core subjects. Plus up to one subject from the Project Management stream

- Management and Leadership for Engineers
- Building Information Modelling
- Quality and Reliability
- Managing Change for IS Professionals
- Engineering Entrepreneurship

Project Management Stream – 37.5 points

Students must complete three subjects including at least two of the following core subjects. Plus up to one subject from the Change Management stream

- Sustainable Infrastructure Engineering
- Project Management Practices
- Engineering Project Implementation
- Engineering Contracts and Procurement

Please note: subjects offered may change from year to year. Refer to University Handbook for up-to-date subject listings at: handbook.unimelb.edu.au/view/current/761EM

ENVIRONMENTAL ENGINEERING

As we alter the Earth's natural systems at an unprecedented rate, there has never been a greater need for environmental engineers and their work in devising, evaluating and managing sustainable solutions with consideration for the economy, society and the environment.

Courses in Environmental Engineering

- Master of Engineering (Environmental)
- Master of Environmental Engineering

Master of Engineering (Environmental)

Environmental engineers create sustainable solutions to environmental problems. You will learn from leaders in hydrology, hydraulics, water resources and waste management. You will be guided by consultants, who will share their expertise in environmental engineering projects from around the world, in countries, such as China, Vietnam, Thailand, Nepal, Sri Lanka and India. The course features guest lecturers and seminars by industry professionals, community project work, technical society meetings and site visits. This professional-entry-level course will lead to a formal qualification in environmental engineering.

Career Outcomes

Environmental engineering is a rapidly growing field and is an exciting area for anyone with an interest in understanding complex environmental systems and developing the technical, management and policy solutions to deal with these issues. With growing opportunities, as well as new kinds of jobs being developed in environmental areas, such as bushfire protection, carbon management, climate change, sustainable systems, land and water management, conservation and hydrology, waste management and renewable energy, you can be assured of a satisfying career. Employment opportunities exist in consulting firms, conservation and natural resource management agencies, environmental protection agencies, catchment management authorities, and in research, government and academia. Companies that employ environmental engineering graduates include: GHD, Golder Associates, Alluvium, Jacobs, John Holland, Coffey International Pty Ltd and AECOM.

Engineer a sustainable environment

After doing vacation work at environmental engineering company Alluvium, Amanda Shipp obtained a part-time role with the company while she studied the Master of Engineering (Environmental). Amanda has since joined Alluvium on a full-time basis, working on urban water projects, such as designing wetlands and constructed waterways, modelling water quantity and quality, and assessing waterway health.

"I enjoy working on a variety of projects with people, who are industry leaders. The challenge of trying to engineer the environment, while working with it, rather than against it, is a great part of my job."

Amanda Shipp
Environmental Engineer
Alluvium

Studying Environmental Engineering in your undergraduate degree

Sample plan: Bachelor of Science with a major in Civil Systems[1,2]

Year 1	Sem 1	Engineering Systems Design 1	Calculus 2	Science Major (chemistry, biology or earth sciences recommended)	Breadth (Shaping Environments recommended)
Year 1	Sem 2	Engineering Systems Design 2	Linear Algebra	Science Major (chemistry, biology or earth sciences recommended)	Breadth
Year 2	Sem 1	Engineering Mechanics	Engineering Mathematics	Science elective	Breadth
Year 2	Sem 2	Engineering Materials	Earth Processes for Engineering	Science elective	Breadth
Year 3	Sem 1	Fluid Mechanics	Engineering Risk Analysis	Science elective	Breadth
Year 3	Sem 2	Systems Modelling and Design	Structural Theory and Design	Science elective	Breadth

Studying Environmental Engineering in your graduate degree

Sample plan: Master of Engineering (Environmental)[2]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Engineering Practice and Communication	Engineering Mathematics	Fluid Mechanics	Risk Analysis
Sem 2	Engineering Mechanics	Earth Processes for Engineering	Engineering Materials	Systems Modelling and Design

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Quantitative Environmental Modelling	Sustainable Infrastructure Engineering	Engineering Site Characterisation	Approved elective
Sem 2	Engineering Project Implementation	Civil Hydraulics	Environmental Analysis Tools	Monitoring Environmental Impacts
Sem 1	IE Research Project 1	Environmental Engineering elective	Environmental Engineering elective	Environmental Engineering elective
Sem 2		Integrated Design – (Infrastructure) OR Integrated Design (Civil)	Environmental Engineering elective	Environmental Engineering elective

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

Master of Environmental Engineering

Environmental engineers manage and evaluate sustainable solutions for their impact on the economy, society and the environment. This program provides engineers with advanced knowledge and skills in sustainable development and environmental management. You will develop a broad understanding of environmental management practice, while investigating themes that focus on waste management, energy and water resources. You will model and analyse the environmental impacts of engineering solutions and discover the best ways to manage the environmental aspects of business.

The program has a strong industry focus with at least half of all subjects led by industry practitioners. You may also undertake a research project in industry as part of your course. You will develop skills in an environmental sector of your own interest. Topics covered will range from air pollution, water and wastewater, municipal solid wastes, cleaner production, environmental management systems, noise, vibration, water resources management and energy resources management, to politics, the law and the economy. This program will suit qualified engineers wanting to upskill, change their career, or extend their current knowledge of environmental engineering.

Career Outcomes

Environmental engineering is a growth area with many job opportunities in fields such as bushfire protection, carbon management, climate change, sustainable systems, land and water management, conservation and hydrology, waste management and renewable energy.

Career opportunities exist in government environmental organisations and in a variety of consulting and technical roles in industry. Our graduates work as environmental officers with local councils and other government authorities and in water and land management roles for the Environment Protection Authority, Department of Sustainability and Environment, water and water catchment authorities and as consultants. Companies that employ environmental engineering graduates include: GHD, Golder Associates, Alluvium, John Holland, Coffey International and AECOM.

Course Structure

You will complete a one year (100 point) full-time (or part-time equivalent) program, consisting of eight subjects of 12.5 points each. Students must take four 12.5 point core subjects and 37.5 points of subjects from one of the following three themes:

- Waste Management
- Energy
- Water Resources

Core subjects

- Sustainable Infrastructure Engineering
- Quantitative Environmental Modelling
- Monitoring Environmental Impacts
- Environmental Analysis Tools

Waste Management focus – 37.5points

- IE Research Project 1 (with approval)
- IE Research Project 2 (25 points) (with approval)
- Solid Wastes to Sustainable Resources
- Water and Waste Water Management
- Environmental Management ISO 14000
- Contaminant Hydrology

OR

Energy focus – 37.5points

- IE Research Project 1 (with approval)
- IE Research Project 2 (25 points) (with approval)
- Energy for Sustainable Development
- Solar Energy
- Energy Efficiency Technology
- Sustainable Buildings

OR

Water Resources focus – 37.5points

- IE Research Project 1 (with approval)
- IE Research Project 2 (25 points) (with approval)
- Environmental Applied Hydrology
- Water and Waste Water Management
- Sustainable Water Resources Systems
- International River Basement Management

Suggested Approved electives

- Environmental Applied Hydrology
- Foundations of Spatial Information
- Geotechnical Applications
- Engineering Contracts and Procurement
- Sustainable Water Resources Systems
- Groundwater Hydrology

Please note: subjects offered may change from year to year. Refer to University Handbook for up-to-date subject listings at: handbook.unimelb.edu.au/view/current/206EC

Learn to create a more sustainable world

Jorge Orjuela works as a consultant in the energy industry. He decided it was time to learn more about environmental engineering, so that he could answer the increasing number of environmental questions and concerns of his customers.

"My clients have been asking questions, not just in relation to energy management, but also water management and waste management and matters related to sustainability and the environment. Studying the Master of Environmental Engineering seemed like a great opportunity to expand my knowledge in these areas."

Environmental engineering is a growing field and there are lots of opportunities to work for larger companies that have environmental concerns or requirements.

Jorge Orjuela Pinzon
Energy and Environmental Reporting Manager
Energy Action

INFORMATION TECHNOLOGY

Information Technology is revolutionising our society, from business and health, to manufacturing and entertainment. IT underlies scientific discoveries and medical breakthroughs, helps develop innovative new products and services, and is central to many aspects of modern life.

#1
in Australia for Computer Science and Information Systems

QS World University Rankings by Subject 2016

Courses in information technology

- Master of Engineering (Software)
- Master of Engineering (Software with Business)
- Master of Engineering (Spatial)
- Master of Information Systems
- Master of Information Technology
- Master of Science (Computer Science)
- Master of Data Science

Master of Engineering (Software) or (Software with Business)

Software engineers use an understanding of computer science, design, engineering, management, mathematics and psychology to enable team production of large software systems. You will combine mathematical, scientific and technical knowledge with creativity to tackle large-scale software design and development projects. You will have the opportunity to work closely with IT professionals in a year-long industry project, as well as building the essential teamwork skills required to implement and operate software engineering solutions in industry. These professional-entry-level courses will lead to a formal qualification in software engineering.

Career Outcomes

The IT industry is experiencing a critical skills shortage in Australia and highly-trained graduates are in strong demand. Career opportunities exist in a wide variety of roles, including as software designers and developers, project managers, database managers, programmers, web producers, analysts, gaming software authors and consultants to the private sector or government. Our graduates work for companies such as AMP, Google, IBM, Microsoft, NAB, Fujitsu, GE, KPMG, BHP Billiton and Deloitte.

Develop an app that goes global

While still a student of the Master of Engineering (Software) Andy Sum has co-created 'Crossy Road', a mobile game that has stormed worldwide app charts and earned Andy and his business partner a seven-figure salary. The retro arcade-styled game was downloaded over 60 million times in the first year of its release.

"Our aim for Crossy Road was to make it appeal to as many people as possible. Once we were featured by the App Store we started getting hundreds of thousands of downloads each day. We realised it was big, but we were thinking 'When is it going to drop?' However, our downloads have just been going up. It took us about a month before we realised how big the game actually was."

Studying Software Engineering in your undergraduate degree

Sample plan: Bachelor of Science with a major in Computing and Software Systems[1,2,3]

Year 1	Sem 1	Foundations of Computing	Calculus 2	Science elective	Breadth
Year 1	Sem 2	Foundations of Algorithms	Linear Algebra	Science elective	Breadth
Year 2	Sem 1	Design of Algorithms	Science elective	Science elective	Breadth
Year 2	Sem 2	Object Oriented Software Development	Database Systems	Science elective	Breadth
Year 3	Sem 1	Software Modelling and Design	Computer Systems	Science elective	Breadth
Year 3	Sem 2	IT Project	Models of Computation	Science elective	Breadth

Studying Software Engineering in your graduate degree

Sample plan: Master of Engineering (Software)[2,4]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Algorithms and Complexity	Programming and Software Development	Internet Technologies	Engineering Computation
Sem 2	Software Modelling and Design	Database Systems	Models of Computation	CIS elective

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Software Requirements Analysis	IT Project and Change Management	Engineering Practice and Communication	CIS Advanced elective
Sem 2	Masters Software Engineering Project	Software Testing and Reliability	CIS elective	CIS Advanced elective
Sem 1	Masters Advanced Software Project	High Integrity Systems Engineering	Modelling Complex Software Systems	CIS Advanced elective
Sem 2		Software Design and Architecture	CIS Advanced elective	Approved elective

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

[3] This plan is general and based on a student having no programming experience. The Department of Computing and Information Systems offers a programming proficiency test. Students who pass this test may follow a different course plan.

[4] Master of Engineering (Software with Business) students will replace five electives with five business subjects.

Master of Engineering (Spatial)

Spatial information is an essential and indispensable part of any economy's infrastructure. It is a rapidly expanding field, fuelled by the growth in information and communication technology, satellites for imaging and positioning, and the web and communication infrastructure for access to spatial data using smart devices.

The Master of Engineering (Spatial) focuses on the science and technology of measurement, mapping and visualisation. You will develop sought-after skills in areas, such as geographic information systems (GIS), three-dimensional computer visualisations, surveying and satellite and photographic image processing. This professional-entry-level course will lead to a formal qualification in spatial information.

Applicants with a strong interest in applied computing, information technology and software development, may be interested in the Master of Information Technology (Spatial) (see page 36).

Career Outcomes

The spatial information industry comprises remote sensing from satellites, aircraft and ground-based sensors, global positioning systems, conventional surveying, geographic information systems and all forms of data with a geographic coordinate. There is a growing demand for expertise in spatial information, along with a current labour shortage in Australia, ensuring graduates a range of well-paid employment options. Career opportunities exist in roles relating to land and surveying, in environmental remote sensing, disaster management and in firms specialising in land and resource management, mapping, three dimensional visualisation and spatial data infrastructure. You will find work with organisations such as Geomatic Technologies, Spatial Vision, Photomapping Services, the Office of the Surveyor-General, Reeds Consulting and Geoscience Australia.

#13
in the world for Computer Science and Information Systems

QS World University Rankings by Subject 2016

Join a new and rapidly expanding industry

Claudia Nguyen was attracted to the broad scope of spatial information technology.

"There's the IT component that gives you the programming, the engineering component which looks at the civil engineering side of the industry, and then the GIS side, which is the spatial component."

Claudia was able to find work in the spatial industry, while still studying her Master's degree and has already experienced a variety of work settings.

"I currently work at a geospatial company and have previously worked in local government, giving me a taste of how I can apply my degree in different organisations.

Since completing the course, Claudia works as a spatial consultant with AAM, a geospatial services company that specialises in the collection, analysis, presentation and delivery of geospatial information.

Claudia Nguyen
Spatial Consultant
AAM

Studying Spatial Information in your undergraduate degree

Sample plan: Bachelor of Science with a major in Spatial Systems[1,2]

Year 1	Sem 1	Foundations of Computing	Calculus 2	Science subject	Breadth
Year 1	Sem 2	Foundations of Algorithms	Linear Algebra	Science subject	Breadth
Year 2	Sem 1	Applications of GIS	Engineering Computation	Science subject	Breadth
Year 2	Sem 2	Surveying and Mapping	Database Systems	Science subject	Breadth
Year 3	Sem 1	Engineering Risk Analysis	Imaging the Environment	Science subject	Breadth
Year 3	Sem 2	Integrated Spatial Systems	Land Administration Systems	Science subject	Breadth

Studying Spatial Information in your graduate degree[3]

Sample plan: Master of Engineering (Spatial)[2]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Engineering Computation	Risk Analysis	Applications of GIS	Imaging the Environment
Sem 2	Surveying and Mapping	Integrated Spatial Systems	Land Administration Systems	Mathematics of Spatial Information

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Foundations of Spatial Information	Engineering Practice and Communication	Management of Technological Enterprises	Approved elective
Sem 2	Spatial Analysis	Spatial Visualisation	Satellite Positioning Systems	Approved elective
Sem 1	*February Semester Advanced Surveying and Mapping	Spatial Databases	IE Research Project 1	Approved elective
Sem 2	Remote Sensing	Engineering Project Implementation		Spatial Data Infrastructure

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

[3] Students interested in spatial information may also undertake the Master of Information Technology (Spatial). See page 36.

Master of Information Systems

The Master of Information Systems (MIS) is a premier professional degree for aspiring and current practitioners and consultants in digital business. The MIS was designed in consultation with leading IT decision-makers, ensuring that it is among the most industry-relevant graduate IT programs in Australia. The program covers areas of critical importance to IT employers, such as project and change management, emerging technologies, IT strategy and governance, security and service provision. You will develop a strong capability in supporting, managing and changing business processes through information and communications technology and information systems. You will also develop valuable transferable skills in solving business problems, collaboration, project management and application of models, frameworks and management theory.

Career Outcomes

The MIS is for those interested in professional or research careers in IT management and digital business; professionals supporting, managing and changing business processes through information and communications technology and information systems. MIS graduates are highly-regarded by top firms and government agencies searching for tomorrow's digital business thinkers and leaders. Graduate jobs include roles such as management consultant, systems analyst/designer, IT infrastructure manager, business analyst and data architect. You will find employment opportunities with organisations such as Accenture, PwC, KPMG, Ernst & Young, IBM, Deloitte and AMP.

Course Structure

The MIS is a two year (200 point) full time program. Applicants with an IS or IT undergraduate qualification and work experience may be eligible for advanced standing, which may shorten the duration of the course by one semester, and up to a maximum of one year full-time.

Core subjects – 50 points:

- Fundamentals of Information Systems
- Database Systems and Information Modelling
- Organisational Processes
- Introduction to Application Development

Lower core subjects – 50 points:

- Managing ICT Infrastructure
- Process Analysis Modelling and Design
- Professional IS Consulting
- IT Project and Change Management

Upper core subjects – 50 points

- Emerging Technologies and Issues
- Enterprise Applications & Architectures
- IS Strategy and Governance
- Impact of Digitisation

Elective subjects – 50 points:

Elective streams are available in areas such as: eHealth, IS Project and Change Management, IT Service Provision, Business Analytics, IT Innovation and Interaction Design, Spatial Information, Information Systems Research, Accounting and Finance, People Management, Operations and Marketing, General Management, Information Technology and Industry Based Learning.

Research pathways, which allow for entry into a PhD, are available to eligible students. A research specialisation is available for students receiving less than 50 points of advanced standing, and a research studies elective stream is available for students receiving 50 points or more of advanced standing.

Students not interested in research may apply for a range of competitive internship and industry based learning subjects.

A specialisation in Health may be available in 2017.

For more information about subjects, specialisations, research pathways, and internship and industry based learning subjects view the University Handbook online at **handbook.unimelb.edu.au/view/current/MC-IS**

Please note: subjects offered may change from year to year.

Get the right mix of IT and business

The Master of Information Systems (MIS) has provided Neha Soni with the right mix of business and technical skills.

"Along with the technical know-how, the MIS has helped me develop and enhance fundamental business skills like requirements gathering, communication, problem solving and team building."

Neha works as a Business Analyst with Deloitte providing advisory and implementation services to a vast range of clients from the public and private sectors.

"Consulting enables me to branch into different roles and projects and gain experience across a range of industries. I enjoy learning about new industries and businesses and getting a taste of what it might be like to work in those settings."

Neha Soni
Business Analyst
Deloitte

Master of Information Technology

Are you passionate about cutting-edge technology and its applications in solving real-world problems across all areas of business, government, health and society? The Master of Information Technology (MIT) will provide you with lifelong technical skills and problem-solving ability.

The program is available in three specialisations – Computing, Distributed Computing and Spatial. You will learn the fundamental adaptable technical skills that are applicable across a range of IT platforms; skills that will not date, such as applied algorithmics, data mining, distributed computing and programming language design, allowing you to evolve with and adapt to the swift pace of technology. As industry continues to be transformed by IT, a new workforce with transferrable problem-solving skills is in high demand. The MIT is closely aligned with industry and includes competitive enrolment in a 25 point industry placement.

Career Outcomes

As critical skills shortages continue in the IT industry, MIT graduates will be well placed to secure exciting roles worldwide, whatever their specialisation. MIT graduates will possess the highly transferrable theoretical and technical skills that will make them globally-mobile and sought after by industry. A wealth of graduate careers are available in areas such as cloud computing, web and mobile app development, and disaster management and GPS technology, in senior IT roles such as, app developer, data analyst, system programmer, cloud computing specialist, disaster management expert and mobile-location based app designer, and many more.

Course Structure

The MIT is a two year (200 point) full time program. Applicants with a previous qualification in IT and work experience may be eligible for advanced standing, which may shorten the duration of the course by one semester, and up to a maximum of one year full-time.

For more information about subjects, research pathways, and internship and industry based learning subjects view the University Handbook online at: **handbook.unimelb.edu.au/view/current/MC-IT**

MIT (Computing)

A flexible course option for attaining transferrable technical and problem-solving skills.

You will work across disciplines and learn how to design, analyse, implement and evaluate IT projects and future needs in the changing context of the IT industry.

Major strands of study include:

- IT project and change management
- Software development
- Programming languages
- Artificial intelligence
- Software design

Employment opportunities:

Senior IT and network positions, e.g. data analyst, business analyst, database developer, web developer, mobile app developer and system programmer.

MIT (Distributed Computing)

Learn to manage large quantities of data through distributed systems.

You will develop cloud computing solutions, devise innovative broadband applications, and work on team projects applying distributed computing technologies to e-science and e-business.

Major strands of study include:

- Mobile computer systems programming
- Cloud computing
- High performance computing
- Distributed algorithms
- Parallel computing

Employment opportunities:

Senior roles in web services, e-business, cloud computing, mobile systems programming and sensor networks, working as project leaders, network analysts, mobile applications developers and more.

MIT (Spatial)

Prepare for a career in the spatial information industry, one of the fastest-growing IT sectors in the world.

You will learn to analyse, communicate and visualise spatial information in all its forms.

Major strands of study include:

- Spatial databases
- Spatial programming
- Web and mobile mapping and spatial services

Plus electives in

- Satellite positioning
- Remote sensing, and more...

Employment opportunities:

Senior roles in designing mobile location based applications and games, working with spatial ICT to manage infrastructure and transport issues, optimising disaster management and response, working as policy advisors to governments and NGOs.

Develop the skills to succeed in industry

Master of Information Technology (Computing) student Jun Jen Chen enjoys the practical real-world assignments that he gets to work on in his course.

On a recent internship with Infosys in India, Jun Jen noted that he was able to use skills learnt at university on his work projects.

"It is fulfilling to know that not only do I enjoy what I'm studying, it is also what I would be doing in an industry setting."

Jun Jen says that the assignment work is challenging and rewarding.

"In one of my assignments, I made a social media platform similar to Instagram. Knowing that I can make something that is comparable with industry standards is very satisfying."

Jun Jen Chen
MIT (Computing)

SCAN THIS IMAGE WITH LAYAR APP

Master of Data Science

New in 2017

The management and analysis of big data is becoming increasingly important in commerce, industry and applied science. Data science is a rapidly growing field that has evolved to address this need and sits at the intersection of statistics and computer science. The newly-established Master of Data Science combines these disciplines in a single coordinated program. Students will develop the technological abilities and analytical skills needed to manage and gain insights from large and complex collections of data. You will additionally become well-versed in using statistical tools, techniques and methods, along with in-depth analysis and evaluation, to solve real-world problems in the data realm.

Career Outcomes

Graduates will find employment in a wide variety of settings in the information technology industry, in commerce and finance and in the applied sciences.

Course Structure

You will complete a two year (200 point) full-time or part-time equivalent program, consisting of 50 points of prerequisite subjects in either Statistics or Computer Science, depending upon your previous studies, four core subjects (50 points) in Statistics and four core subjects (50 points) in Computer Science, a two-subject (25 points) capstone project in Data Science and two electives (25 points). Students who meet the prerequisites for both Statistics and Computer Science, may be eligible for advanced standing of up to 50 points.

Statistics Prerequisites (50 points)

for students who meet the Computer Science prerequisites.

- Methods of Mathematical Statistics (25 points)
- A First Course in Statistical Learning (25 Points)

OR

Computer Science Prerequisites (50 points)

for students who meet the Statistics prerequisites.

- Programming and Software Development
- Algorithms and Complexity
- Internet Technologies
- Database Systems and Information Modelling

Core subjects – Statistics (50 points)

- Mathematical Statistics
- Statistical Modelling
- Computational Statistics and Data Mining
- Multivariate Statistical Techniques

Core subjects – Computer Science (50 points)

- Knowledge Technologies
- Advanced Database Systems
- Statistical Machine Learning
- Distributed Systems

Capstone Project (25 points)

- Data Science Project

Electives (25 points)

- IT Industry placement
- Analysis of High Dimensional Data
- Advanced Statistical Methods

Master of Science (Computer Science)

The Master of Science (Computer Science) is a research training program for students to undertake a substantive research project in a field of choice, as well as a broad range of coursework subjects including a professional skills component, as a pathway to PhD study, or to the workforce.

The technologies covered in the program are changing the way we live our lives, especially in the health sciences, and in social infrastructures delivered by web-based tools.

In addition to a broad grounding across the breadth of advanced computer science, you will develop specialist knowledge in at least one of the following areas: knowledge systems, programming languages and distributed computing, information systems, mathematics, statistics, spatial information, or linguistics.

Career Outcomes

Computer scientists find roles as data analysts, applications programmers, information architects, systems and network analysts, software designers and engineers, project managers, research engineers and computational researchers. The course is accredited by Euro-Inf® providing professional recognition and employment opportunities in Europe.

Course Structure

You will study a combination of discipline and professional skills core subjects, as well as undertake a research project of 75 points, for a total of 200 credit points of study.

Research Project – 75 points

- Computer Science Research Project

Discipline Core Subjects – 50 points

- Knowledge Technologies
- Declarative Programming
- Distributed Systems
- Research Methods

Select one or two professional skills subjects from:

- Thinking and Reasoning with Data
- Systems Modelling and Simulation
- Statistics for Research Workers
- Science Communication
- Communication for Research Scientists
- Science in Schools
- Science and Technology Internship

Select at least three elective subjects.

View list at **handbook.unimelb.edu.au/view/current/MC-SCICMP**

Please note: subjects offered may change from year to year.

Enhance your studies with an internship

During her Master of Engineering (Mechanical), Catherine Phillips completed an internship with ExxonMobil, where she worked as a subsurface engineer, developing a plan to reinstate hydrocarbon production from a damaged offshore well. Catherine developed a technical understanding of subsurface engineering techniques and technologies and learnt to use software relating to oil and gas production.

"My role involved liaising with vendors and technical experts, and then presenting my recommendations to senior management. I most enjoyed the independent nature of my work, as I was able to manage my own progress and drive the direction of my project. It was also really valuable getting to practice communicating technical ideas to non-technical audiences, and learning about the standards required in a professional environment."

Catherine has recently obtained a graduate engineering role with IBM.

Catherine Phillips
IBM

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MECHANICAL ENGINEERING AND MECHATRONICS

#1
in Australia for Mechanical, Aeronautical and Manufacturing Engineering

QS World University Rankings by Subject 2016

Mechanical and Mechatronic Engineering applies human and material resources to the design, construction, operation and maintenance of machines to move people, goods and materials, generate energy, produce goods and services, control pollution and dispose of wastes.

Courses in Mechanical Engineering and Mechatronics

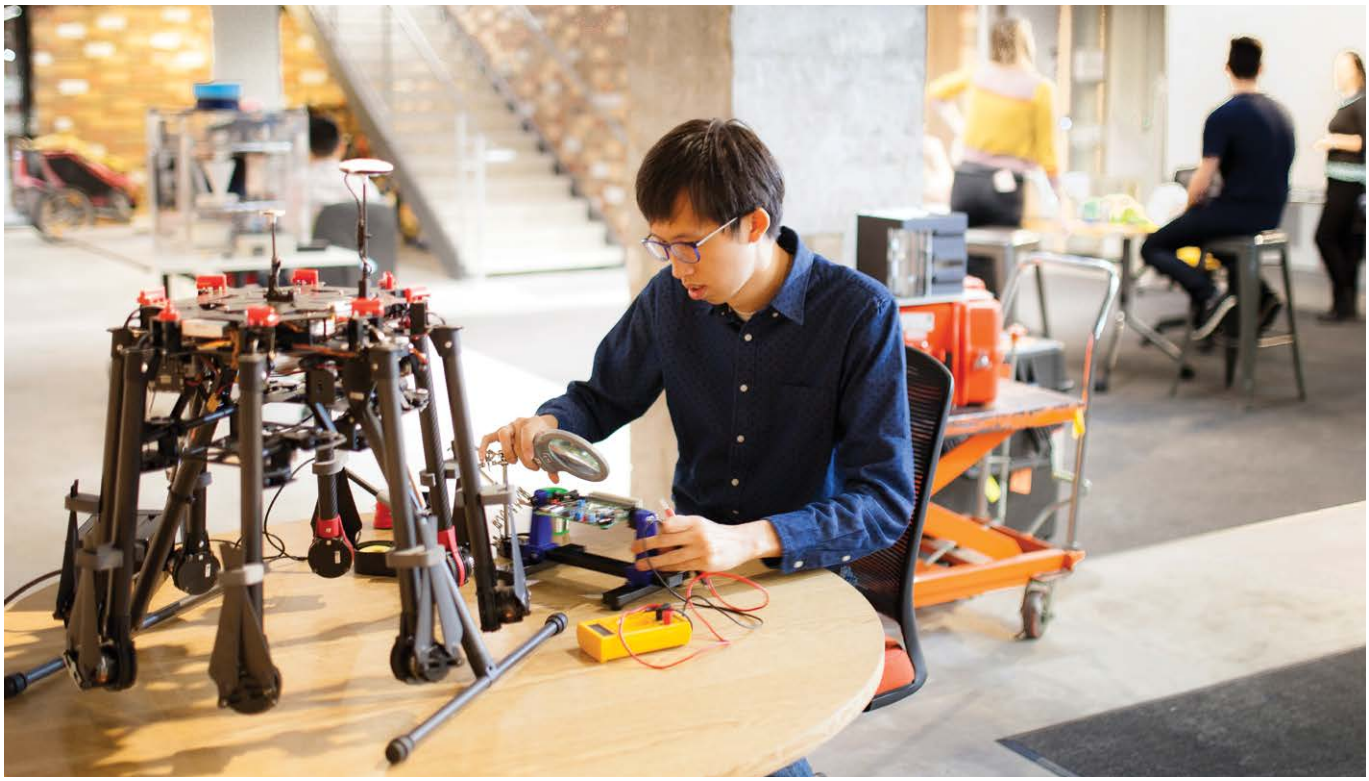
- Master of Engineering (Mechanical)
- Master of Engineering (Mechanical with Business)
- Master of Engineering (Mechatronics)

Master of Engineering (Mechanical) or (Mechanical with Business)

Mechanical engineers turn energy into power and motion, focusing on the generation, conversion and use of energy, as well as the design, construction and operation of devices and systems. You will learn from world leaders in fluid mechanics, turbulence and biomechanics. Opportunities to consolidate theory with practice will come from group activities, site visits and industry projects. You will have access to well-equipped laboratories for materials testing, engine/turbine testing, wind tunnel investigations, simulation and metal forming processes. A heavy engineering workshop is available for the manufacture of testing facilities and research apparatus, as well as extensive computer facilities. These professional-entry-level courses will lead to a formal qualification in mechanical engineering.

Career Outcomes

Mechanical engineering not only interacts with all other disciplines of engineering, but increasingly with other disciplines such as medicine and biology, supported by sophisticated computer technology. You will develop a breadth of skills and depth of fundamental knowledge, which will open up a wide variety of possible career directions. Career opportunities exist in a diverse range of industries from aeronautics, automotive, robotics, manufacturing and environmental consultancies, to management and finance. Emerging technologies in bioengineering, materials science, and nanotechnology will create further opportunities. Our graduates are employed by companies such as AECOM, Alcoa, BP Australia, ExxonMobil, Orica Limited, Origin Energy, Bosch, Shell, Jacobs and OZ Minerals.



Studying Mechanical Engineering in your undergraduate degree

Sample plan: Bachelor of Science with a major in Mechanical Systems[1,2]

Year 1	Sem 1	Engineering Systems Design 1	Calculus 2	Physics 1	Breadth
Year 1	Sem 2	Engineering Systems Design 2	Linear Algebra	Physics 2: Physical Science & Technology	Breadth
Year 2	Sem 1	Engineering Computation	Science elective	Science elective	Breadth
Year 2	Sem 2	Engineering Mechanics	Engineering Mathematics	Science elective	Breadth
Year 3	Sem 1	Thermodynamics and Fluid Mechanics	Mechanics & Materials	Science elective	Breadth
Year 3	Sem 2	Systems Modelling and Analysis	Mechanical Design	Science elective	Breadth

Studying Mechanical Engineering in your graduate degree

Sample plan: Master of Engineering (Mechanical)[2,3]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Engineering Mechanics	Engineering Mathematics	Mechanics and Materials	Engineering Computation
Sem 2	Systems Modelling and Analysis	Mechanical Design	Thermodynamics and Fluid Mechanics	Foundations of Electrical Networks

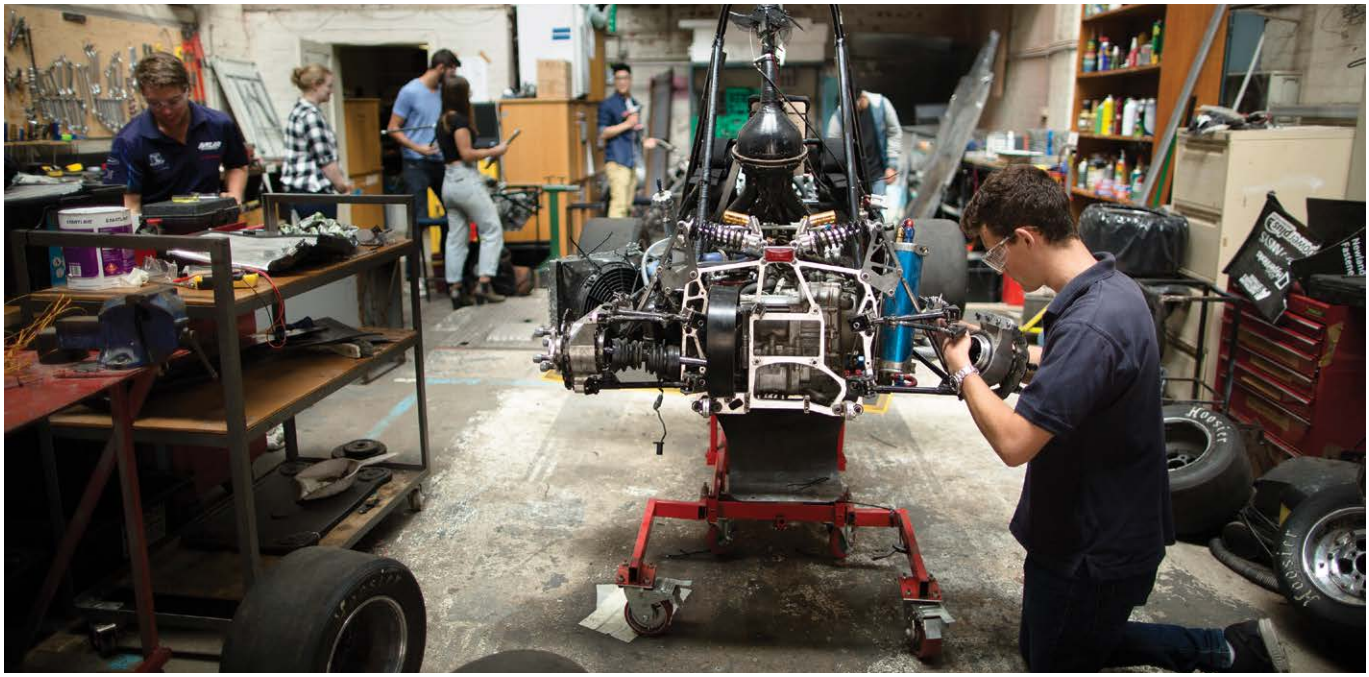
Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Dynamics	Control Systems	Materials	Design for Manufacture
Sem 2	Fluid Dynamics	Solid Mechanics	Engineering Practice and Communication	Design for Integration
Sem 1	Mechanical Engineering elective	Mechanical Engineering elective	Thermodynamics	Capstone Project
Sem 2	Mechanical Engineering elective	Mechanical Engineering elective	Mechanical Engineering elective	

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

[3] Master of Engineering (Mechanical with Business) students will replace five electives with five business subjects.



Master of Engineering (Mechatronics)

Mechatronics Engineering is a fast-changing discipline that blends mechanical, electrical and software engineering to develop automation and advanced manufacturing technologies.

You will develop in-depth technical knowledge across the interdisciplinary domain of automation, which encompasses key components of mechanical and electrical engineering supported by a strong background in computing and software engineering. You will design and create automated solutions feature computer control, and will have exposure to industry through site visits, guest lectures and industry based projects throughout the course. You will have access to world-class facilities, such as a state-of-the-art wind tunnel, alternative fuel engines, rehabilitation and tele-operated robots, motion tracking fluoroscopy, intelligent automotive platforms, service robotics, UAV platforms and intelligent large-scale irrigation and water management systems. This professional-entry-level course will lead to a formal qualification in mechatronics.

Career outcomes

Mechatronics can lead to a wide variety of interesting careers, such as developing 'smart' products and systems in various industries. Job opportunities exist with companies that use advanced automation equipment and computer integrated manufacturing systems, in fields such as aerospace, advanced manufacturing, product development, computing and electronics, software systems, mining, renewable energy and biomedical engineering for companies like Bosch, Honeywell, CNC Design, Ford, ResMed, Siemens, BAE Systems and Invetech Australia.

Create technologies of the future

Self-confessed science fiction fan Ricardo Rosas says that he has always wanted to live in a world with robots. Ricardo decided to study mechatronics, so that he could be part of creating these new technologies.

"I chose mechatronics at Melbourne because of the quality of the research that is done here, and the quality of the university."

During his studies Ricardo has worked on some academic research projects; an experience he values highly.

"I've been working on a couple of the robotics projects with one of the researchers here. It has been a very interesting experience, and one of the highlights of my Masters."

Ricardo Rosas
Master of Engineering (Mechatronics)

Studying Mechatronics in your undergraduate degree

Sample plan: Bachelor of Science with a major in Mechatronics[1,2]

Year 1	Sem 1	Engineering Systems Design 1	Calculus 2	Physics 1	Breadth
Year 1	Sem 2	Engineering Systems Design 2	Linear Algebra	Physics 2: Physical Science & Technology	Breadth
Year 2	Sem 1	Engineering Computation	Engineering Mathematics	Science elective	Breadth
Year 2	Sem 2	Foundations of Electrical Networks	Engineering Mechanics	Science elective	Breadth
Year 3	Sem 1	Analog and Digital Electronics Concepts	Science elective	Science elective	Breadth
Year 3	Sem 2	Mechatronic System Design	Systems Modelling and Analysis	Numerical Programming for Engineers	Breadth

Studying Mechatronics in your graduate degree

Sample plan: Master of Engineering (Mechatronics)[2]

Foundation subjects for students without engineering subjects in the undergraduate degree.

Sem 1	Engineering Mechanics	Engineering Mathematics	Engineering Practice and Communication	Engineering Computation
Sem 2	Numerical Programming for Engineers	Systems Modelling and Analysis	Programming and Software Development	Foundations of Electrical Networks

Usual entry point for applicants from an engineering background, who have received 100 points advanced standing.

Sem 1	Control Systems	Dynamics	Analog and Digital Electronics Concepts	Software Modelling and Design
Sem 2	Mechatronic Systems Design	Embedded System Design	Advanced Control Systems	Advanced Dynamics
Sem 1	Mechatronics Capstone Project	Advanced Motion Control	Mechatronics elective	Mechatronics elective
Sem 2		Sensor Systems	Mechatronics elective	Mechatronics elective

[1] Sample plans assume entry requirements for Calculus 2 have been met. See handbook.unimelb.edu.au/view/current/MAST10006

[2] Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/view/current/MC-ENG

RESEARCH PROGRAMS

At the Melbourne School of Engineering, we aim to create technological solutions to significant problems faced by our world today, in areas such as: water resource management, clean energy, disaster management, climate change, safer and more efficient transport, cancer treatment, epilepsy suppression, food processing, automated interpretation of data, personalised medicine, and smart grids.

Research is undertaken by multidisciplinary teams from across the School and the University, and in collaboration with academic and industry partners. With strong backing from industry and government, the MSE offers a well-supported research environment, with many opportunities for research students to work on leading projects.

Measured on research income, we are one of the largest engineering research institutions in Australia. We are home to large-scale research consortia such as the Centre for Neural Engineering, the Centre for Disaster Management and Public Safety and the Melbourne Networked Society Institute. We have close, ongoing partnerships with IBM Research, the Peter Cook Centre for Carbon Capture and Storage, Dairy Innovation Australia Ltd, Microsoft, Rio Tinto and Ford, and we work on projects with many more private and public sector organisations in Australia and internationally.

We have some of Australia's most distinguished research and academic staff in the fields of engineering and IT, including a Prime Minister's Prize Winner, Fellows of the Royal Society, an Australian Research Council (ARC) Laureate, ARC Future Fellows and Eureka Prize winners.

Master of Philosophy (MPhil) – Engineering

The MPhil is an internationally recognised masters by research program that provides students with the opportunity to carry out an independent and sustained research project under supervision. Students will develop advanced research skills and techniques, and present findings in a documented, scholarly format.

An MPhil is normally a one-and-a-half year full-time program, with a minimum duration of one year full-time and a maximum of two years part-time. MPhil students may apply for transfer to PhD candidature, ideally before the end of their first year. The transfer application must have the strong support of the candidate's supervisor and department. More information is available at: **eng.unimelb.edu.au/study/degrees/master-researchengineering/overview**

Finding a research project

Graduate Research Opportunities are advertised online at: **eng.unimelb.edu.au/research/graduate-research-opportunities**

Doctor of Philosophy (PhD)

The PhD is designed for students to demonstrate academic leadership, independence, creativity and innovation in their research work. In addition, professional doctoral studies provide advanced training designed to build expertise in a specialist area, while encouraging the acquisition of a wide range of advanced and transferable skills. The PhD thesis demonstrates authority and contributes to knowledge in the candidate's field. It is deeper and more comprehensive than the MPhil. Initial admission to PhD candidature is probationary. After 12 months, full-time candidates are eligible for admission to confirmed candidature. Confirmed candidature is normally for a further period of two years full-time. Candidates are guided by a research supervisor, who arranges a research program designed to suit the individual requirements and interests of the candidate. More information is available at: **eng.unimelb.edu.au/study/degrees/phd/overview**

Research Opportunities by Discipline

Biomedical Engineering

By fully integrating medicine, biology and engineering principles, biomedical engineering aims to provide a better understanding of the body and how to treat diseases. New technologies have increased our understanding of how biological systems work, making biomedical engineering one of the most exciting and challenging areas in engineering today. Biomedical engineering is a truly interdisciplinary area, with staff participating in the program from across the School, working in the heart of Australia's premier clinical and bioresearch hub in Parkville.

We aim to pursue research and development opportunities where engineering expertise is essential to address clinically meaningful problems. Through our collaborations with St Vincent's Hospital Melbourne, the Royal Melbourne Hospital, the Hugh Williamson Gait Analysis Laboratory at the Royal Children's Hospital, the Bionics Institute, the Centre for Neural Engineering, Bio21, the Walter and Eliza Hall Institute, the Ludwig Cancer Institute, Murdoch Children's Research Institute, Bionic Vision Australia and others, we are delivering world-class research in the areas of biomechanics, biosignals, computational bioinformatics and biocellular systems to address issues, such as medical bionics, immune system function, infection, epilepsy and cancer treatment.

Chemical and Biomolecular Engineering

The Department of Chemical and Biomolecular Engineering has a large and diverse research program, which focuses on four key scientific themes: materials development, separations technologies, surface chemistry and rheology, and bioengineering. These scientific themes are targeted at key socioeconomic fields, which include medicine, mining, sustainable energy production, water conservation and re-use and food processing.

Examples of current research activities include investigation into soil remediation in Antarctica, production of biofuel from algae, reduction of evaporation in water catchments, new materials for carbon capture and storage, targeted drug and vaccine delivery and cheese microstructure.

The Department is home to several major research centres:

- Particulate Fluids Processing Centre (PFPC)
- Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC)
- ARC Dairy Innovation Hub
- The Peter Cook Centre for Carbon Capture and Storage (CCS) Research

and is a key collaborator in:

- ARC Centre of Excellence in Convergent Bio-Nano Science and Technology
- Melbourne Materials Hallmark Initiative
- ARC Hub – Unlocking The Food Value Chain: Australian Food Industry Transformation for ASEAN Markets
- CRC for Polymers

Computing and Information Systems

The Department of Computing and Information Systems is an international research leader, delivering impact in three key areas data and knowledge, platforms and systems, and people and organisations. Research strengths include data mining and machine learning; big data management and processing; information processing; natural language processing; computational health and bioinformatics; sensing, ubiquity, and mobility; extreme distributed systems; optimisation; programming languages, security; e-Science; complex intelligent systems; cloud computing; interaction design; business information systems; knowledge management; health information systems and technology; and human-computer interaction and user interfaces.

Our researchers are engaged in a wide range of projects and collaborative ventures with organisations such as IBM's Global Research and Development Lab, the Victorian Life Sciences Computing Initiative, the Melbourne Networked Society Institute, Orygen Youth Mental Health, the Defence Science Institute, the Australian Urban Research Information Network, Data61, and the Microsoft Research Centre for Social Natural User Interfaces.

We develop innovative solutions that create value from data leading to better outcomes in health, education, and business. We create valuable data products through the use of machine learning, data mining, information processing, spatial and temporal data analysis, constraint optimisation, and computational semantics. We investigate innovative solutions for connected systems that can operate intelligently, securely, and efficiently. In order to exploit the opportunities available through big data, distributed knowledge, cloud infrastructure, and the internet of things, we create innovative tools, techniques and architectures. We design systems and IT applications that directly affect people and organisations. We examine the interaction of people, processes, and technology in order to support improved outcomes for individuals and communities in areas such as health and business.

Electrical and Electronic Engineering

The Department of Electrical and Electronic Engineering has a vibrant, internationally recognised research program, which receives exceptional support from industry and government and is focused in three key discipline areas: information, computation and communications networks; photonics, electronics and nanoengineering; and signals, systems, control, optimisation and power engineering.

Topics of interest include: mobile and wireless networks; network design and performance monitoring; optical communication systems; wireless communication; integrated nanoelectronics and nanophotonics; sustainability of growth of the internet; computational neuroscience; neuroimaging; audition, speech and bionic ear design; bionic eye design and vision; error control coding and information theory; distributed optimisation and networked control; decision and game theory; mathematical systems theory; energy-efficient (communication) systems; power electronics; electrical power systems; power system dynamics; data mining; signal processing and radar tracking; and control systems, with applications to water management and defence.

The Department is home to a number of research centres and labs, including:

- Centre for Neural Engineering
- Melbourne Networked Society Institute
- ARC Research Network on Intelligent Sensors, Sensor Networks and Information Processing
- Defence Science Institute
- Photonics Research Laboratory
- Control and Signal Processing Laboratory
- Future Grid Research Laboratory
- Innovative Manufacturing Cooperative Research Centre

Infrastructure Engineering

The Department of Infrastructure Engineering is a unique blend of the disciplines of civil and environmental engineering and spatial information, focused on solving large infrastructure problems, such as improving building construction, transport, water resource systems, catchment management and agriculture. The department has established excellent links with industry and government both nationally and internationally. Research projects focus on significant and topical subject matter, in the three main areas of civil infrastructure, environmental hydrology and water resources, and spatial information.

Areas of research strength include: structural engineering and infrastructure protection; geotechnical, geo-environmental and reservoir engineering; project management; energy efficiency in buildings; integrated and intelligent transport; disaster management; geothermal energy; catchment systems; environmental monitoring and assessment; environmental water and water resource management; river basin science and policy; hydrological processes; ecohydraulics; next generation flood prediction; impacts of climate change; positioning and sensing; land administration and 3D cadastre; mobile mapping; remote sensing; environmental sensing and modelling; spatial cognitive engineering; and spatial data infrastructure design and development.

The Department of Infrastructure Engineering is home to:

- Centre for Spatial Data Infrastructure and Land Administration
- Australia-China Joint Research Centre on River Basin Management
- ARC Training Centre for Advanced Manufacturing of Prefabricated Housing
- Centre for Disaster Management and Public Safety

Mechanical Engineering

The Department of Mechanical Engineering is acknowledged internationally for its excellence in research, attracting research students and staff of the highest calibre. We undertake research that is relevant to society and industry, with a focus on building new partnerships with experts in the following research themes: autonomous systems; biomechanics; fluid dynamics; and thermodynamics, focussing on a range of areas including: energy systems and their optimisation; biomedical device development and testing; and automation and robotics.

Researchers in the Autonomous Systems group investigate new and challenging problems in dynamics and control, predominantly inspired by applications in the areas of energy and biomedical systems. Biomechanics research is highly cross-disciplinary and brings together experts in musculoskeletal modelling, injury, rehabilitation and mechanobiology. Fluid mechanics research is both experimental and computational, with a strong reputation for expertise in turbulence and wall-bounded flows. The fluid mechanics group applies unique capabilities and world-class facilities to a wide range of fluids problems. Thermodynamics research is undertaken in low emissions combustion and energy systems to achieve low emissions of greenhouse gases and other pollutants in a cost-effective manner.

The Department of Mechanical Engineering is involved in the following research groups and centres:

- Advanced Centre for Automotive Research and Testing
- Defence Materials Technology Centre
- Robotics Research Laboratory
- Neuromuscular Lab
- Biomotion Laboratory
- Cell and tissue biomechanics lab
- Dynamics & Control Research Lab
- Walter Bassett Aerodynamics Lab
- Michell Hydrodynamics Lab

More information about research at the Melbourne School of Engineering at:
eng.unimelb.edu.au/research/graduate-research-opportunities

STUDENT OPPORTUNITIES

MELBOURNE
#1
most live-able city in the world

The Economist Intelligence Unit, 2015

Global Mobility Program (Exchange and Study Abroad)

The University of Melbourne offers a range of scholarships, bursaries, and other funding options to help you complete part of your course at one of approximately 180 exchange partner institutions in 39 countries. Investigate engineering exchange scholarship opportunities before embarking on a semester of study overseas. For more information about study abroad and exchange visit: **mobility.unimelb.edu.au**

Clubs and societies

There are many student clubs and societies, which provide a diverse range of interests and activities throughout the year. It's a great way to make friends and create networks that will last a life time.

Some of these clubs include:

- Engineering Music Society
- Engineers Without Borders (University of Melbourne chapter)
- Melbourne University Engineering Student Club (MUESC)
- International Engineering and Science Society (IESS)
- Computing and Information Systems Students Society (CISSA)
- Robogals (Melbourne chapter)
- Women in ICT
- Women in Science and Engineering (WISE)

More info available at **umsu.unimelb.edu.au/jump-in/clubs/**

Engineers Without Borders

Engineers Without Borders (EWB) is an organisation that aims to make a difference globally through humanitarian engineering.

Our partnership with Engineers Without Borders creates unique opportunities to:

- Gain skills and knowledge to make a positive contribution in support of the world's most disadvantaged communities.
- Get involved in special educational programs, where you may design a creative solution to a real world problem or collaborate on a sustainable project.
- Inspire high school students about sustainable engineering and community development through outreach programs.
- Network with industry partners, attend industry events and find a project mentor.
- Gain access to work and internship opportunities.

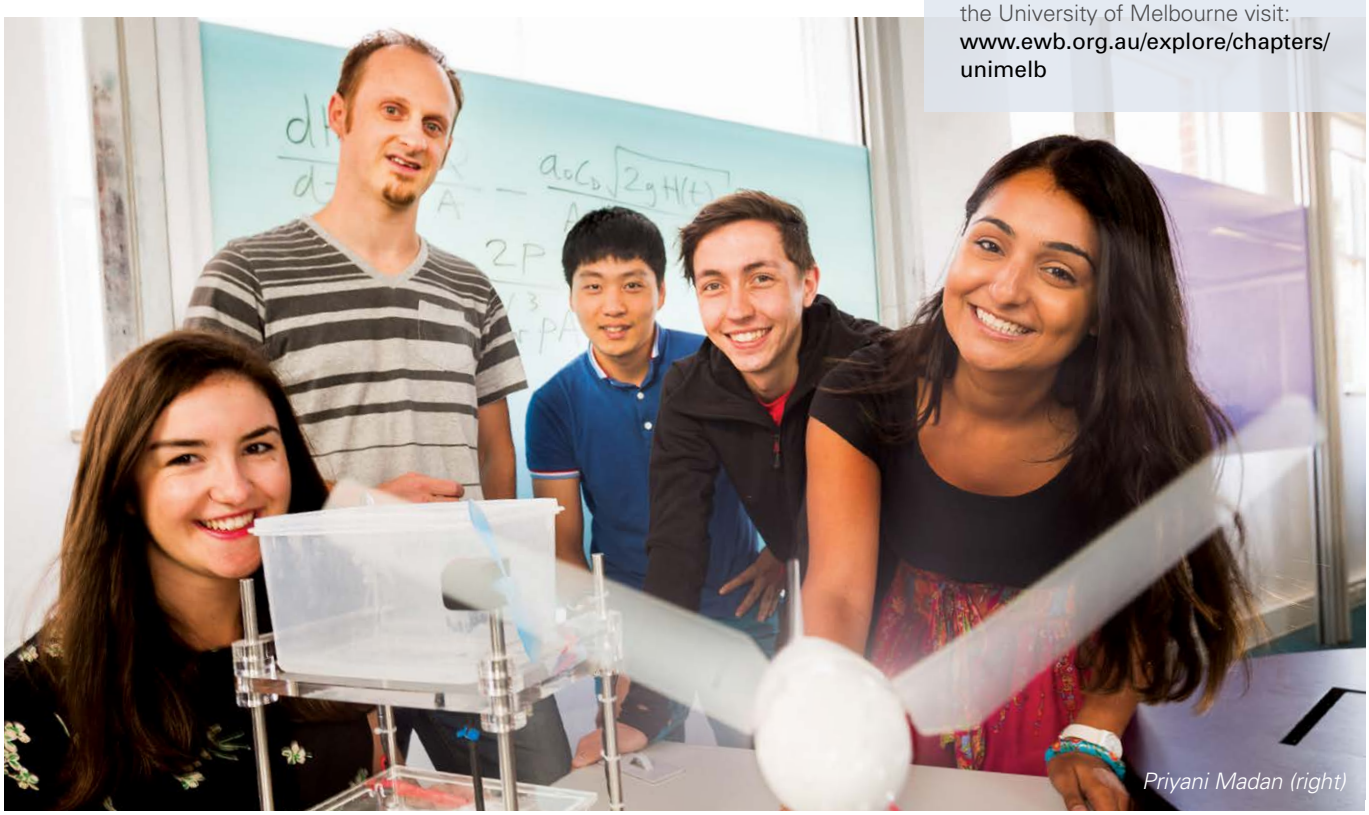
The chance to make a difference

While studying the Master of Engineering (Civil) Priyani Madan has been actively involved with Engineers without Borders (EWB) Victoria and is currently a local partnership manager with the organisation. In this role, she manages a partnership, a team, two programs and over 200 volunteers.

Priyani is passionate about humanitarian work and the impact that engineering can have on solving big problems in society. EWB has taken her all over Australia and to Cambodia, exposing her to engineering in the developing world.

"I am interested in becoming an engineer, because it will allow me to assist developing communities in attaining their basic human rights, such as clean running water, adequate sanitation and renewable electricity."

For more information about EWB at the University of Melbourne visit: **www.ewb.org.au/explore/chapters/unimelb**



Priyani Madan (right)

MELBOURNE ACCELERATOR PROGRAM

Engineering and IT students can turn their innovative ideas into successful startups thanks to the Melbourne Accelerator Program (MAP). This unique startup incubator gives students and alumni the opportunity to forge their careers as entrepreneurs with the support of fellowship grants, office space and access to a network of mentors and investors.

MAP is Australia's leading entrepreneurship program, and has been ranked 13th entrepreneurial program in the world by the leading Swedish-based UBI Index. MAP aims to support entrepreneurs of all stages, through a program of public events, workshops and feeder programs and to accelerate the growth of world class startups.

Creating sustainable energy solutions with MAP

Electrical engineering PhD candidate Valentin Muenzel is Co-Founder and CEO of Relectrify, a 2015 MAP cohort and Tech23 award-winning startup.

Relectrify is commercialising an advanced battery management system to provide an affordable and sustainable solution to the rapidly growing need for energy storage.

Phones, laptops and electric cars all use rechargeable lithium-ion batteries. Most of these batteries are discarded, with around 80% of their capacity still intact, creating harmful e-waste and wasting money.

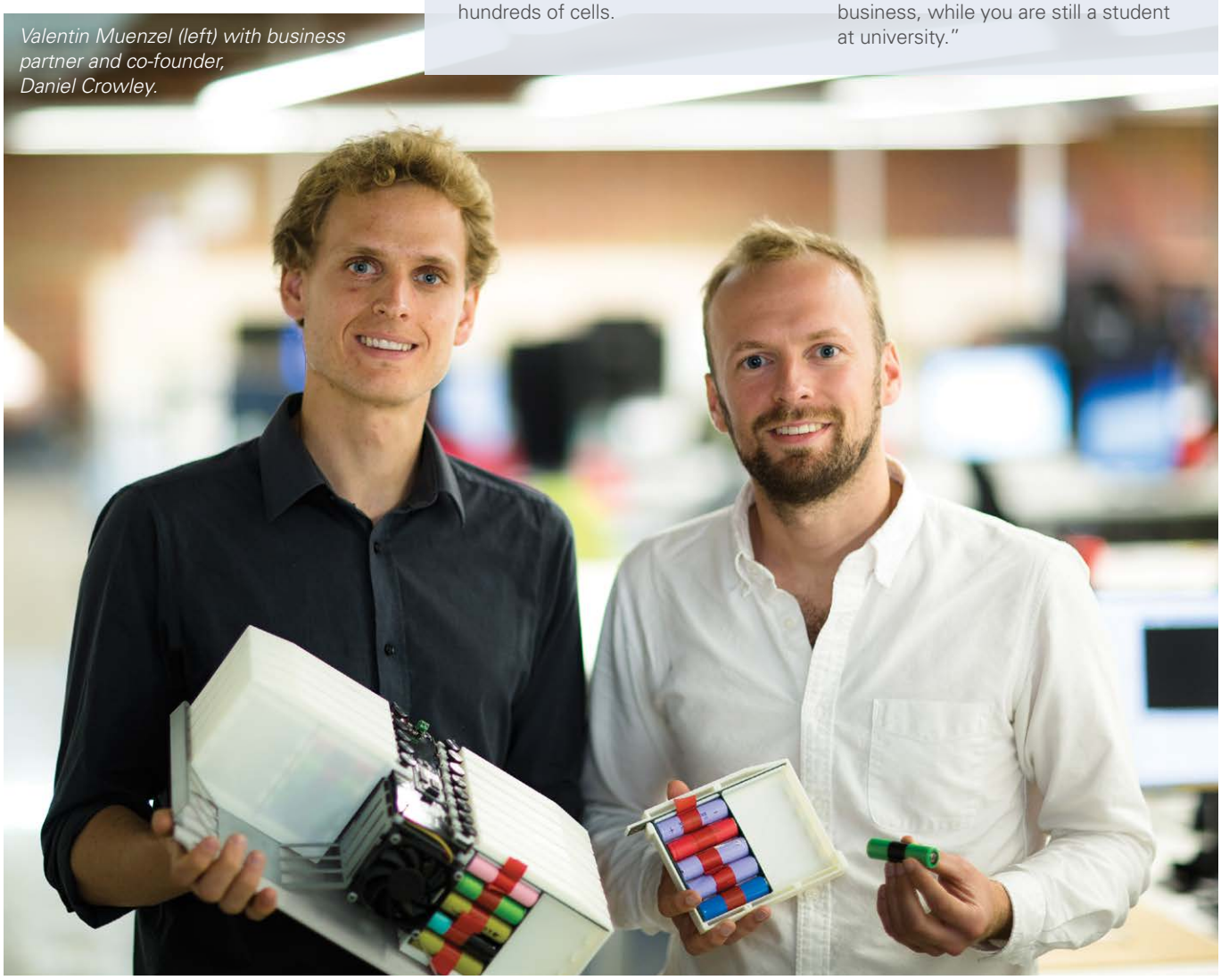
Relectrify's technology overcomes key technical challenges in standard battery packs, whereby the weakest individual battery cell can limit the performance of an entire pack of hundreds of cells.

"By combining used but still capable battery cells with our technology, we create battery packs that are uniquely affordable and sustainable. These battery packs are for households and businesses to store solar energy, saving both money and our environment."

Relectrify is working with key partners in Australia and abroad to bring their technology to market.

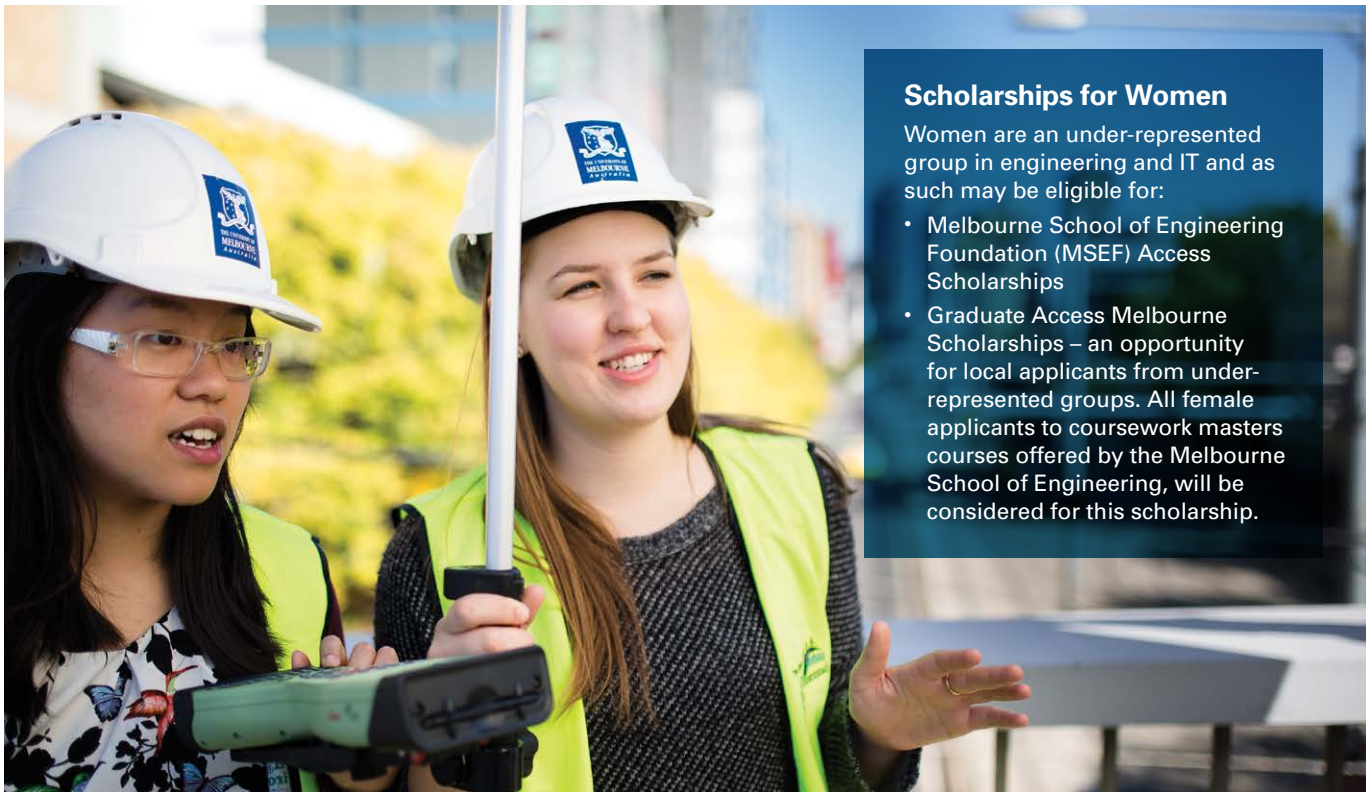
"MAP provides a unique opportunity to be part of a community of like-minded and engaged people, focussed on building successful companies," Valentin says.

"The unique blend of training, mentorship and financial support MAP provides, can turn your entrepreneurial ideas into a successful business, while you are still a student at university."



Valentin Muenzel (left) with business partner and co-founder, Daniel Crowley.

WOMEN IN ENGINEERING AND IT



Scholarships for Women

Women are an under-represented group in engineering and IT and as such may be eligible for:

- Melbourne School of Engineering Foundation (MSEF) Access Scholarships
- Graduate Access Melbourne Scholarships – an opportunity for local applicants from under-represented groups. All female applicants to coursework masters courses offered by the Melbourne School of Engineering, will be considered for this scholarship.

Women in Science and Engineering (WISE)

WISE is a student club aiming to attract more female science and engineering students into industry. WISE holds regular networking events, and offers academic and career assistance to female engineering and science students. WISE events include coffee and cake days, industry panels, workshops, site visits and more. Further information at:

- facebook.com/wiseunimelb
- twitter.com/wiseunimelb
- wiseunimelb.com

Girl Geek Dinners Melbourne

Girl Geek Dinners (Melbourne chapter) is a non-profit organisation dedicated to breaking down gender stereotypes, identifying and removing barriers to participation in technology, and encouraging women to enter technology industries. In addition to dinners, events include panel discussions, workshops and field trips. Further information at:

- facebook.com/ggdmelb/
- twitter.com/ggdmelb
- meetup.com/Girl-Geek-Dinners-Melbourne/

INTERNSHIPS AND INDUSTRY PROJECTS

Strengthen your employment prospects by undertaking an internship in industry, or an industry project.

Internships and industry projects are available to eligible students enrolled in professional entry Masters courses, including:

- The Master of Engineering (in 11 technical and 6 'with business' specialisations)
- The Master of Information Systems
- The Master of Information Technology

Internships

The internship subject allows students to undertake professional-level work to develop workplace skills and prepare for employment in industry. Internships run for 10-15 weeks, for a total of approximately 350 hours. The program runs three times a year and is worth 25 credit points. Entry into an internship is competitive. High achieving final year students from the Master of Engineering, Master of Information Technology and Master of Information Systems degrees will be selected into a limited number of placements.

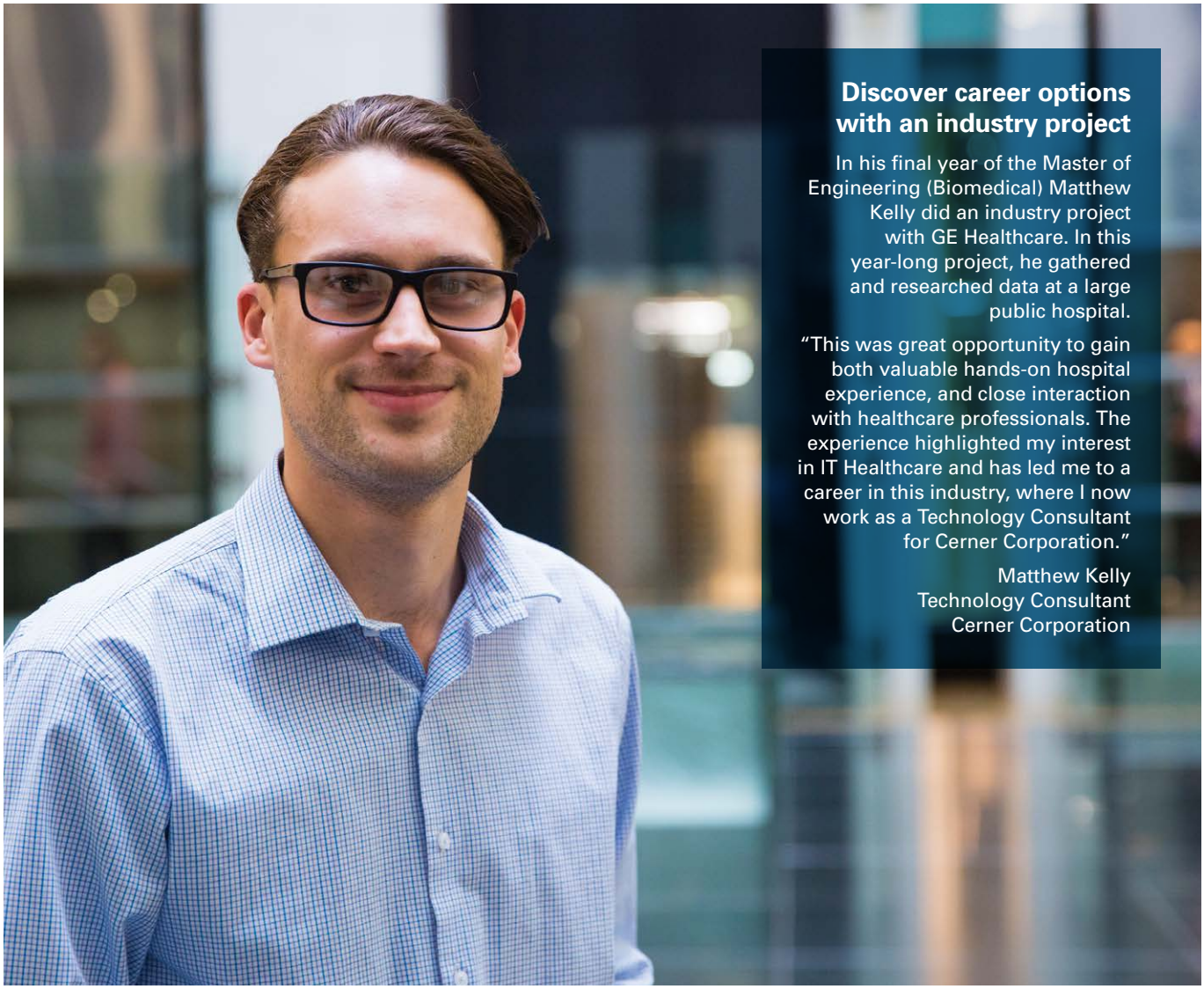
Industry Projects

Industry projects are available to all students from the Master of Engineering, Master of Information Technology and Master of Information Systems degrees. Students work on a collaborative industry research or design project. Projects are usually taken part-time over a full year (12.5 points per semester), or part-time for one semester (25 points), or full-time during summer semester.

Other industry opportunities

Students enrolled in IT courses may also be interested in applying for Tin Alley beta internships, for an opportunity for internships in the IT startup community. All budding entrepreneurs are welcome to apply for a position in the Melbourne Accelerator Program (MAP), or to learn from its many non-accelerator activities.

Other opportunities for students to gain exposure to industry include site visits, field work, guest lecturers, industry nights and networking events.



Discover career options with an industry project

In his final year of the Master of Engineering (Biomedical) Matthew Kelly did an industry project with GE Healthcare. In this year-long project, he gathered and researched data at a large public hospital.

"This was great opportunity to gain both valuable hands-on hospital experience, and close interaction with healthcare professionals. The experience highlighted my interest in IT Healthcare and has led me to a career in this industry, where I now work as a Technology Consultant for Cerner Corporation."

Matthew Kelly
Technology Consultant
Cerner Corporation

HOW TO APPLY

How to apply for an undergraduate degree

Domestic students

Domestic students applying for an undergraduate course must apply through the Victorian Tertiary Admissions Centre (VTAC).
Full details at **vtac.edu.au**

More information at: futurestudents.unimelb.edu.au/admissions/applications/ug-dom

International students

International students who are currently studying in Australia (either completing Year 12 or studying another undergraduate degree) must apply through VTAC.

International students currently studying outside of Australia can either apply directly to the University online or through a local University of Melbourne representative.

More information at: **futurestudents.unimelb.edu.au/admissions/applications/ug-int**

How to apply for a graduate coursework degree

Application checklist

1	Check the entry requirements and make sure you're eligible (See Quick Reference Guide on pages 5–8 for a complete list of entry requirements or go to: handbook.unimelb.edu.au)
2	Ensure you meet the University's English language requirements (see page 52)
3	Gather the supporting documentation listed below.
4	Complete the online application form: eng.unimelb.edu.au/study/degrees

Required documentation (non-UoM graduates only)

1. Certified copy of academic results with a grading scale
2. Certified copy of certificate of completion
3. Syllabus /subject descriptions for maths, science and other technical subjects (Master of Engineering applicants only)*

*Applicants who have completed a Washington Accord accredited engineering degree and are applying for the same engineering discipline (excluding Biomedical and all "with business" streams) are not required to submit syllabus/subject description.

Additional documentation

Evidence of any relevant work experience if required (see pages 5–8 for entry requirements). Evidence of work experience includes: a current curriculum vitae (CV) and reference letters from your employer(s) on company letterhead.

Application closing dates

Semester 1: (February commencement)	Semester 2: (July commencement)
Professional Masters: 30 November	All courses[1], all applicants: 30 April
Specialised Masters International Students: 30 December	
Specialised Masters Local students: 30 January	

Applicants, who supply all supporting documentation, can expect to receive a response to their application within 6-8 weeks.

[1] Please note, the Master of Energy Systems is only offered for entry in semester one.

How to apply for a research degree

Before you apply, find a supervisor

As a research student you will work under the guidance of an academic supervisor, who will provide advice and direction throughout your research project. Your project is often part of a larger project run by your supervisor. It is your responsibility to identify a supervisor you would like to work with, prior to making an application. You must supply documented evidence that you have secured a supervisor, who has agreed to work with you on your research proposal.

How to find a project/supervisor

To search for available PhD projects visit **eng.unimelb.edu.au/study/degrees/phd/projects**

To search for a supervisor visit **findanexpert.unimelb.edu.au**

Graduate research application checklist

You need:

- A qualification from a University with a well-recognised research profile
- Documented support of a University of Melbourne academic to supervise your project
- Evidence of completing a research project that accounts for at least 25% of one year's work at 4th year Bachelor's or at Master's level
- A weighted average equivalent to the University of Melbourne's 80%.

Full details are available at: **eng.unimelb.edu.au/study/degrees/phd/apply-now**

Scholarships – what is a competitive score?

80%	• Competitive for entry, but does not guarantee admission. • A competitive score for local applicants from Go8 institutions for an Australian Postgraduate award
85%	• A competitive score for local applicants from non Go8 institutions for an Australian Postgraduate award • A competitive score for international applicants for a Melbourne International Research Scholarship and Fee Remission Scholarship
92%	• Competitive score for International Postgraduate Research Scholarships for international applicants.

Please note: these are University of Melbourne equivalent scores taking into consideration transcripts, publications, research experience and the ranking of your previous institution. All applications for admission will be considered for scholarships automatically. Further details are available at: eng.unimelb.edu.au/study/degrees/phd/fees-scholarships

Application deadlines

Applications for admission may be submitted at any time.

English language requirements

All students studying at the University of Melbourne must satisfy the University of Melbourne English language entry requirements.

Full details are available at: **futurestudents.unimelb.edu.au/admissions/entry-requirements/language-requirements**

One of the following scores are required for entry to graduate courses. Required scores must be achieved in one sitting within 24 months before your application.

	IELTS* (academic English only)	TOEFL (paper-based test)*	TOEFL (internet-based test)*	Pearson Test of English (Academic)	Cambridge English Advanced / Certificate of Advanced English (CAE)
English language requirements:	6.5 (no band less than 6.0)	577 + TWE 4.5	79 + Writing 21; Speaking 18; Reading 13; Listening 13	58–64 inclusive and no communicative skill below 50	58 + no less than Borderline for each skill
Alternative English language requirements*	6.0 (no band less than 5.5)	550 + TWE 4.0	60 + Writing 18; Speaking 16; Reading 8; Listening 7	50 and no communicative skill below 42	

*International applicants who have met the alternative English language scores may gain entry by successfully completing the University of Melbourne English Language Bridging Program (UMELBP). For more details: hawthornenglish.com/UMELBP.html

SCHOLARSHIP OPPORTUNITIES

Engineering and IT Scholarships

The Melbourne School of Engineering offers a range of scholarships for students at undergraduate, graduate and PhD level. All scholarships are awarded on a competitive basis based on academic performance. Separate applications are not required for incoming student scholarships, all students will be considered for the relevant scholarships at the time of their course offer.

Undergraduate Scholarships

- The Paterson Scholarship Approximately $4,000 per year for 5 years (3 year engineering pathway degree + 2 year Master of Engineering).

Full details of engineering and IT scholarship opportunities are listed at: **eng.unimelb.edu.au**

Scholarships for current students

Once enrolled, there are other scholarships opportunities available for current students. Details are available at: **currentstudents.eng.unimelb.edu.au/coursework/scholarships.html**

University of Melbourne Scholarships

The University of Melbourne offers one of the most generous and comprehensive scholarship programs in Australia, which recognises the outstanding academic achievement of students from Australia and around the world at undergraduate, graduate and PhD level. The University also acknowledges a special responsibility to provide access to higher education to those students who might otherwise be excluded by socioeconomic, cultural, geographic or other disadvantages.

To view the full range of Melbourne scholarships visit: **services.unimelb.edu.au/scholarships**

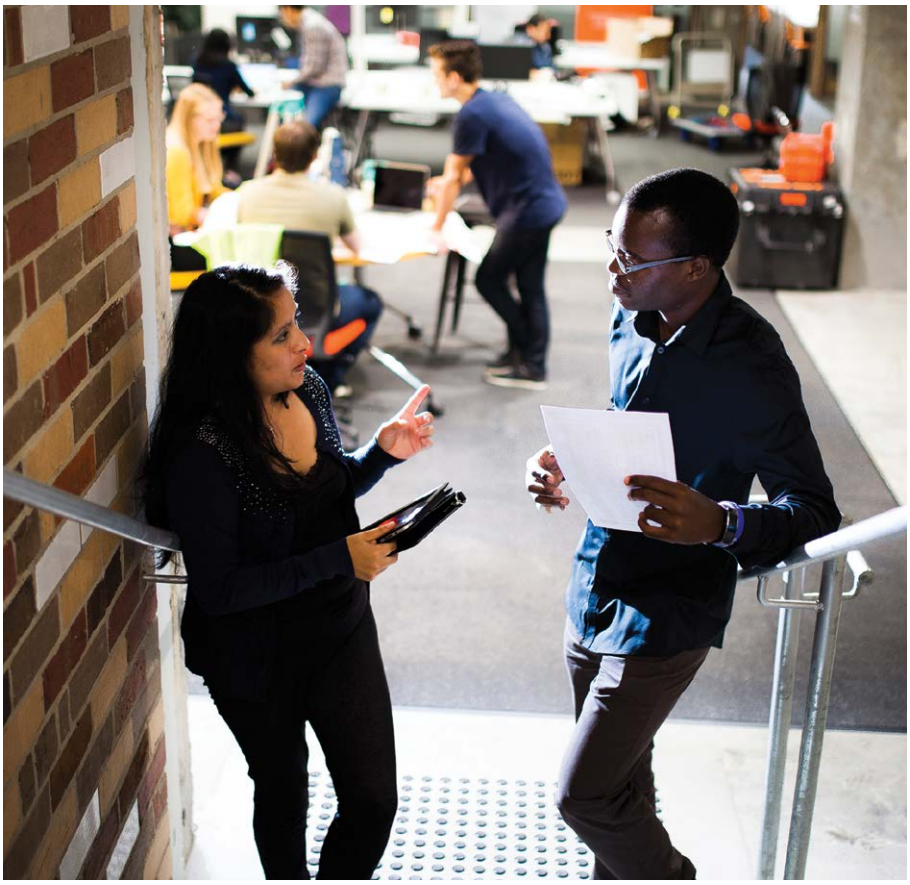
Information and Enquiries:

13 MELB (13 6352)
+61 3 9035 5511

13melb@unimelb.edu.au

Graduate Coursework Scholarships

Scholarship	Eligible Courses	Amount awarded	Who is it for?
Melbourne School of Engineering Foundation Scholarships	Professional Masters Programs • Master of Engineering • Master of Information Technology • Master of Information Systems	$10,000 (Local students) $20,000 (International students)	Local and International students
Women in Engineering and IT Scholarships	Professional Masters Programs (as above)	$5,000 or $10,000	Local students only
International Postgraduate Coursework Awards	All engineering and IT coursework programs	50% fee remission	International students only
JH Mirams Memorial Scholarships	All specialised masters programs	$5,000	Local and International students



FEES AND FUNDING SUPPORT

Commonwealth Supported Places (CSPs)

Domestic students, who are offered a CSP, pay part of the tuition fee (the student contribution) and the Australian Commonwealth Government pays the remaining contribution. The amount of the student contribution is based on the subjects in which you enrol, rather than the overall course. Eligible students can apply for a HECS-HELP loan.

HECS-HELP

HECS-HELP is a loan scheme that allows eligible domestic students in a Commonwealth Supported Place (CSP) to defer their student contribution payments. In the HECS-HELP scheme the Australian Government pays your student contribution amount. You only repay your HECS-HELP loan once your income meets the threshold. More information at: **studyassist.gov.au**

Australian Fee Places

Domestic students, who are offered an Australian Fee Place are required to pay the full cost of tuition for a course, without a government subsidy. Eligible students can apply for a FEE-HELP loan.

FEE-HELP

If you are enrolled in an Australian fee place, you may be eligible for a FEE-HELP loan from the Australian Government. FEE-HELP can cover all or part of your tuition fees. The Australian Government pays the amount of the loan directly to the University. You then repay your loan through the Australian taxation system, when your income is above the minimum repayment threshold. More information at: **studyassist.gov.au**

Transferring from an Australian fee place to a CSP

High achieving students, who are eligible for a CSP, will be considered for an automatic transfer from an Australian fee place into a CSP, for the remainder of their degree, upon completion of the first 100 points of their studies. There is a limited number of transfers available per semester.

Graduate Access Melbourne

Graduate Access Melbourne provides access to local applicants with personal circumstances that have had a sustained adverse effect on their academic achievement at undergraduate level, or who are members of a specified group known to be under-represented in higher education, such as women in engineering and IT. More information at: **gradaccess.unimelb.edu.au**

Student financial aid

The University's Student Financial Aid service provides students with advice and assistance, including:

- Student loans and bursaries/grants
- Student income support and other government payments
- Cost of living advice
- Budgeting and tax advice

More information at:
services.unimelb.edu.au/finaid

Further Information

Detailed information about fees and funding support for international and local students including undergraduate and postgraduate local and international fee brochures, scholarships, loans and grants, youth allowance, Austudy and ABSTUDY, currency converters, the cost of living in Melbourne and financial aid, is available at: **futurestudents.unimelb.edu.au/admissions/fees**

2017 Course Fees

Course	Domestic fee[1]	International fee[1]
Master of Engineering – in 11 technical specialisations – in 6 'with business' specialisations	$31,680 per annum CSPs will be available[2]	$38,976 per annum
Master of Energy Systems	$31,680 per annum	$38,976 per annum
Master of Engineering Management – in 2 specialisations	$31,680 per annum	$38,976 per annum
Master of Engineering Structures	$31,680 per annum	$38,976 per annum
Master of Environmental Engineering	$31,680 per annum	$38,976 per annum
Master of Information Systems	$28,544 per annum CSPs will be available[2]	$38,976 per annum
Master of Information Technology – in 3 specialisations	$31,680 per annum CSPs will be available[2]	$38,976 per annum
Master of Telecommunications Engineering	$31,680 per annum	$38,976 per annum
Master of Philosophy – Engineering	RTS places available[3]	$40,032 per annum
PhD	RTS places available[3]	$40,032 per annum

[1] Please note, fees are based on full-time study for the period of one year and are indicative only. Fees are subject to an annual increase. More details can be found at: futurestudents.unimelb.edu.au/admissions/fees

[2] Commonwealth Supported Place (CSP) rates for 2017, listed at: futurestudents.unimelb.edu.au/admissions/fees

[3] Domestic students are exempt from tuition fees under the Australian Government's Research Training Scheme (RTS).

CAREERS AND EMPLOYMENT

Australia's digitally-driven economy is growing, and a workforce equipped with engineering and IT skills is essential to consolidating this opportunity. Innovation in disruptive technologies, such as the Internet of Things, 3D printing and robotics is of key importance in the workplace today. Organisations and individuals within the science, technology, engineering and mathematics (STEM) sector are uniquely positioned to shape this dynamic landscape. Employers are seeking candidates with the right combination of technical and professional skills to fill these valuable STEM roles. The need for technical expertise is strengthening, while business and communication skills are increasingly valued.

Our graduates enter the workforce with the ability to lead projects and teams, and the creativity to analyse problems and develop innovative solutions.

You will develop strong business, technical and interpersonal skills, in order to meet today's commercial and technical challenges. In a dynamic economic climate, engineers and IT specialists need to be adaptable and ready to navigate fluctuations in the job market. The Australian Government Job Outlook web site has predicted strong job growth in electronic engineering, and industrial, mechanical and production engineering. Strong growth for IT includes roles in software and applications programming, computer networks, database and systems administration, IT security and IT management.

Useful websites:

Australian Government Job Outlook – **joboutlook.gov.au**

Melbourne Careers Centre – **careers.unimelb.edu.au**

#18
in the world for graduate employability

QS World University Rankings, 2015-2016

Graduate salaries[1]

Discipline	Median annual salary before tax	Job category on Job Outlook website
Biomedical Engineering	$78,936	Engineering – Other
Chemical and Biochemical Engineering	$82,732	Engineering – Chemical and Materials
Civil Engineering	$99,996	Engineering – Civil
Electrical Engineering	$104,000 $85,020	Engineering – Electrical Engineering – Electronic
Environmental Engineering	$78,936 $99,996	Engineering – Other Engineering – Civil
Spatial Information[2]	$78,936 $99,996	Engineering – Other Engineering – Civil
IT Professionals	$87,256 $104,000	ICT Business and Systems Analyst ICT Manager
Mechanical Engineering	$86,112	Engineering – Industrial, Mechanical and Production
Mechatronic Engineering[2]	$86,112	Engineering – Industrial, Mechanical and Production
Software Engineering	$83,720	Software and Applications Programmers
Structural Engineering	$99,996	Engineering – Civil

[1] The salary information has been estimated from weekly gross median salary figures taken from the Australian Government's Job Outlook website. This information is intended to be an indicative guide only and salaries will vary on a case by case basis.

[2] Some discipline areas were not covered by the web site, in which case similar disciplines or job titles have been supplied to give a rough guideline.

eng.unimelb.edu.au

Contact us

The Melbourne School of Engineering
The University of Melbourne
Victoria 3010 Australia

Graduate Enquiries

T: +61 3 8344 6944
E: eng.unimelb.edu.au/enquire

Connect with us

13MELB@unimelb.edu.au
eng.unimelb.edu.au
twitter.com/engunimelb
facebook.com/engunimelb
instagram.com/engunimelb
engit.eng.unimelb.edu.au

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