



Melbourne School
of Engineering

2021 Graduate Guide

ENGINEERING AND IT

For more information, visit:
unimelb.edu.au/study/engineering
unimelb.edu.au/study/information-technology

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THE MELBOURNE ADVANTAGE



Study at Australia's
No. 1 university¹



No 7 in the world for
graduate employability²



No. 32
in the world³



Be internationally recognised

Maximise your career opportunities around the world with accreditation from Engineers Australia, Washington Accord (USA) and EUR-ACE® (Europe), learning from academics who are globally recognised in their field.



Be inspired by leading researchers

Learn from world-leading researchers who are working on groundbreaking innovations such as epileptic seizure prediction, chemical blankets to protect our coral reefs, and robots with a human touch.



Connect with industry

The University of Melbourne is No.7 in the world for graduate employability.⁴ Take part in internships, complete industry projects or undertake an innovation challenge with an industry mentor.



Study in the heart of Melbourne,
one of the world's most liveable cities.⁵

Access Australia's leading entrepreneurship and start-up program, the Melbourne Accelerator Program (MAP).

Access a generous scholarships program that supports diversity and acknowledges academic achievement.

Be part of the world-leading innovation precinct Melbourne Connect, opening in late 2020. Discover a new seven-hectare campus for collaboration just five kilometres from the city, opening in 2025.



¹ Times Higher Education World University Rankings 2020

² QS Graduate Employability Rankings 2020

³ Times Higher Education World University Rankings 2020

⁴ QS Graduate Employability Rankings 2020

⁵ Economist Intelligence unit

⁶ QS World University Rankings By Subject 2020

QUICK REFERENCE GUIDE: GRADUATE PROGRAMS

Melbourne School of Engineering offers a range of coursework and research study options designed to prepare you to become a professionally qualified engineer, advance or change your career, or undertake research. Full-time or part-time study, with Semester 1 (February) and Semester 2 (July) entry is available for most courses.

Professional entry programs	Specialised programs	Research degrees	
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.	
Courses	Minimum Entry Requirements ¹	Duration ²	Course Type
BIOMEDICAL ENGINEERING			Page 12
Master of Engineering » Biomedical » Biomedical with Business	Undergraduate degree with: » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year biology, chemistry or physics subjects Advanced standing/credit Up to one year of credit will be awarded to students with a biomedical engineering major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia
CHEMICAL AND BIOCHEMICAL ENGINEERING			Page 16
Master of Engineering » Biochemical ³ » Chemical ³ » Chemical with Business	Undergraduate degree with: » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year chemistry subjects Advanced standing/credit Up to one year of credit will be awarded to students with a chemical engineering major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia » IChemE ⁴
CIVIL AND STRUCTURAL ENGINEERING			Page 20
Master of Engineering » Civil » Civil with Business » Structural	Undergraduate degree with: » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year science subjects Advanced standing/credit Up to one year of credit will be awarded to students with a civil engineering major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia
Master of Engineering Structures	65% weighted average in a four-year civil or structural engineering undergraduate degree Civil engineering graduates must: » Have one year of relevant work experience, or » Have dedicated 30% of course to structural engineering subjects	1 year full-time	Specialised masters

Courses	Minimum Entry Requirements ¹	Duration ²	Course Type
CIVIL AND STRUCTURAL ENGINEERING			Page 20
Graduate Certificate in Port Engineering	<p>» Undergraduate degree in a relevant discipline » 65% weighted average</p> <p>OR</p> <p>» Undergraduate degree in any discipline » 65% weighted average » Two years of documented, relevant professional experience</p>	1 year full-time	Specialised masters Delivered in partnership with Ports Australia
Master of Architectural Engineering	<p>Engineering undergraduate degree:</p> <ul style="list-style-type: none"> » 65% weighted average » Design folio » Equivalent to one architectural history subject » Personal statement of 500 words outlining relevant prior study, work experience and motivation to undertake the program <p>OR</p> <p>Architecture undergraduate degree:</p> <ul style="list-style-type: none"> » 65% weighted average » Design folio » Equivalent of two maths (i.e. Linear Algebra and Calculus 2) and two science subjects » Personal statement of 500 words outlining relevant prior study, work experience and motivation to undertake the program 	3.5 years full-time (must be taken full-time)	Professional entry*
ELECTRICAL AND ELECTRONIC ENGINEERING			Page 26
Master of Engineering	<p>Undergraduate degree with:</p> <ul style="list-style-type: none"> » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year physics subjects <p>Advanced standing/credit</p> <ul style="list-style-type: none"> » Up to one year of credit will be awarded to students with an electrical engineering major in their undergraduate degree 	2-3 years full-time	Professional entry Accreditation: <ul style="list-style-type: none"> » EUR-ACE® » Engineers Australia
ENERGY			Page 30
Master of Energy Systems	<p>Undergraduate degree in a relevant discipline, such as commerce, science or engineering, and:</p> <ul style="list-style-type: none"> » 70% weighted average » Equivalent of one subject in mathematics, statistics or other quantitative subject » 2 years of continuous, documented work experience in a relevant field if you have a weighted average of at least 65% 	1.5 years full-time Semester 1 (February) entry only	Specialised masters
ENGINEERING MANAGEMENT AND BUSINESS			Page 34
Master of Engineering Management	<ul style="list-style-type: none"> » Four-year undergraduate degree in engineering or relevant discipline » 65% weighted average <p>OR</p> <ul style="list-style-type: none"> » A three-year undergraduate degree in a relevant discipline with 65% weighted average » At least two years of full-time documented, relevant work experience since graduation 	1 year full-time	Specialised masters

Courses	Minimum Entry Requirements ¹	Duration ²	Course Type
ENGINEERING WITH BUSINESS			Page 34
Master of Engineering » Biomedical with Business » Chemical with Business » Civil with Business » Electrical with Business » Mechanical with Business » Software with Business ⁴	<p>Undergraduate degree with:</p> <ul style="list-style-type: none"> » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year relevant science subjects (see discipline of interest for details) <p>Advanced standing/credit</p> <ul style="list-style-type: none"> » Up to one year of credit will be awarded to students with a relevant engineering major in their undergraduate degree 	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia
ENVIRONMENTAL ENGINEERING			Page 30
Master of Engineering » Environmental	<p>Undergraduate degree with:</p> <ul style="list-style-type: none"> » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year relevant science subjects <p>Advanced standing/credit</p> <p>Up to one year of credit will be awarded to students with an environmental engineering major in their undergraduate degree</p>	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia
Master of Environmental Engineering	<ul style="list-style-type: none"> » Four-year undergraduate engineering degree » 65% weighted average <p>OR</p> <ul style="list-style-type: none"> » Three-year undergraduate degree in an appropriate discipline » 65% weighted average » At least two years of full-time, documented and relevant work experience 	1 year full-time	Specialised masters
INDUSTRIAL ENGINEERING			Page 36
Master of Industrial Engineering	<p>Undergraduate degree with:</p> <ul style="list-style-type: none"> » 3-year undergraduate degree from the University of Melbourne in any engineering system major » 65% weighted average <p>OR</p> <ul style="list-style-type: none"> » 4-year Bachelor of Engineering degree » 65% weighted average 	2 years full-time	Professional entry
INFORMATION TECHNOLOGY AND SOFTWARE ENGINEERING			Page 38
Master of Engineering » Software ⁴ » Software with Business ⁴	<p>Undergraduate degree with:</p> <ul style="list-style-type: none"> » 65% weighted average » Equivalent of 2 first-year mathematics subjects » Equivalent of 2 first-year computing, programming or computer science subjects <p>Advanced standing/credit</p> <p>Up to one year of credit will be awarded to students with a computing and software engineering major in their undergraduate degree⁵</p>	2-3 years full-time	Professional entry Accreditation: » Euro-Inf® » Australian Computer Society » Engineers Australia

Courses	Minimum Entry Requirements ¹	Duration ²	Course Type
INFORMATION TECHNOLOGY AND SOFTWARE ENGINEERING			Page 38
Master of Information Systems » Health » Professional » Research	<p>Depending on your work experience and undergraduate study, you may be eligible for advanced standing:</p> <p>200 point (2 years full-time) program</p> <ul style="list-style-type: none"> » Undergraduate degree in any discipline » 65% weighted average <p>150 point (1.5 years full-time) program</p> <ul style="list-style-type: none"> » Undergraduate degree in any discipline » 65% weighted average » One year of documented, relevant work experience <p>100 point (1 year full-time) program</p> <ul style="list-style-type: none"> » Undergraduate degree in information systems » 65% weighted average » Two years of documented, relevant work experience 	1-2 years full-time	Professional entry Accreditation: » Australian Computer Society
Master of IT Management (Executive)	<ul style="list-style-type: none"> » Undergraduate degree in an IT-related discipline » 70% weighted average in the final year (or equivalent) » 10 (or at least 5) years of documented, relevant work experience » Personal statement of goals » Employer referee reports 	1 year full-time (online delivery only)	Specialised masters
Master of Information Technology » Artificial Intelligence » Computing » Cybersecurity » Distributed Computing » Human-Computer Interaction » Spatial	<p>Depending on your work experience and undergraduate study, you may be eligible for advanced standing:</p> <p>200 point (2 years full-time) program</p> <ul style="list-style-type: none"> » Undergraduate degree in any discipline » 65% weighted average » One technical computer programming subject <p>150 point (1.5 years full-time) program</p> <ul style="list-style-type: none"> » Three-year undergraduate degree with a major in computer science, information technology, software engineering or related discipline, for example: <ul style="list-style-type: none"> - Computing and Software Systems major in the Bachelor of Science - Computing or Digital Technologies major in the Bachelor of Design » 65% weighted average <p>100 point (1 year full-time) program</p> <ul style="list-style-type: none"> » Four-year undergraduate degree with a major in computer science, information technology, software engineering or related discipline » 65% weighted average and either: <ul style="list-style-type: none"> - Studies in the area of specialisation at an advanced undergraduate level or higher, or: - Two years of relevant, documented work experience in the area of specialisation 	1-2 years full-time	Professional entry Accreditation: » Australian Computer Society » Royal Institution of Chartered Surveyors (Spatial stream only)
Master of Data Science	<p>Undergraduate degree in computer science, data science or statistics</p> <ul style="list-style-type: none"> » 65% weighted average » Equivalent to one subject from computer science or related discipline, focusing on computer programming » Equivalent of two subjects of first-year mathematics (including Calculus 2) 	2 years full-time	Specialised masters
Graduate Diploma of Data Science	<p>Undergraduate degree in any discipline, and the following subjects (or their equivalents):</p> <ul style="list-style-type: none"> » MAST10006 Calculus 2 » MAST10007 Linear Algebra 	1 year full-time	Professional entry

Courses	Minimum Entry Requirements ¹	Duration ²	Course Type
INFORMATION TECHNOLOGY AND SOFTWARE ENGINEERING			Page 38
Master of Science » Bioinformatics	» Undergraduate degree with a major in biology and biomedicine, mathematics and statistics, or computer science » 65% weighted average in the major	2 years full-time	Research pathway
Master of Computer Science	Undergraduate degree with a major in computer science, for example: » Computing and Software Systems major in the Bachelor of Science » Computing major in the Bachelor of Design » 75% weighted average » At least 25 points of university level mathematics or statistics subjects	2 years full-time	Research pathway
Graduate Diploma of Computer Science	Undergraduate degree with: » At least 25 points of Level 1 or above Computer Science subjects, or equivalent » At least 25 points of level 1 or above mathematics or statistics subjects, or equivalent » 65% weighted average	1 year full-time	Professional entry
Graduate Certificate of Computer Science	Undergraduate degree with: » At least 25 points of Level 1 or above Computer Science subjects, or equivalent » At least 25 points of level 1 or above mathematics or statistics subjects, or equivalent » 65% weighted average	6 months full-time	Professional entry
MECHANICAL, MECHATRONICS AND AEROSPACE ENGINEERING			Page 52
Master of Engineering » Mechanical » Mechanical with Business » Mechanical with Aerospace ⁵	Undergraduate degree with: » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year physics subjects Advanced standing/credit Up to one year of credit will be awarded to students with a mechanical engineering major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia
Master of Engineering » Mechatronics	Undergraduate degree with: » 65% weighted average » Equivalent of 2 first-year mathematics subjects (i.e. Linear Algebra and Calculus 2) » Equivalent of 2 first-year physics subjects Advanced standing/credit Up to one year of credit will be awarded to students with a mechanical engineering major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia

Courses	Minimum Entry Requirements ¹	Duration ²	Course Type
SPATIAL INFORMATION			Page 58
Master of Engineering	<p>Undergraduate degree with:</p> <ul style="list-style-type: none"> » Spatial » 65% weighted average » Equivalent of 2 first-year mathematics subjects » Equivalent of 2 first-year relevant science subjects <p>Advanced standing/credit</p> <p>Up to one year of credit will be awarded to students with a spatial engineering major in their undergraduate degree</p>	2-3 years full-time	Professional entry Accreditation: » EUR-ACE® » Engineers Australia » Royal Institution of Chartered Surveyors » Surveyors Registration Board, Victoria (conditional)
Master of Information Technology	See Master of Information Technology entry on page 7		Professional entry Accreditation: » Australian Computer Society » Royal Institution of Chartered Surveyors
GRADUATE RESEARCH			Page 62
Master of Philosophy (MPhil)	<ul style="list-style-type: none"> » Four-year undergraduate degree in a relevant discipline » Must include a substantial research component (equivalent of 25% of one year of full-time study) » 75% weighted average in the equivalent of final year subjects <p>OR</p> <ul style="list-style-type: none"> » A masters degree in a relevant discipline » Must include a substantial research component (equivalent of 25% of one year of full-time study) » 75% weighted average <p>OR</p> <ul style="list-style-type: none"> » Qualification or professional experience considered to be equivalent 	1.5 -2 years full-time	Research degree
Doctor of Philosophy (PhD)	» See Master of Philosophy (above)	3-4 years full-time	Research degree

¹ Minimum entry requirements do not guarantee entry and are listed as a guide only. Grades are calculated as equivalent to the University of Melbourne grades. Visit handbook.unimelb.edu.au for more information.

² Course duration for the Master of Engineering, Master of Information Technology and Master of Information Systems is dependent on prior study and work experience.

³ The Master of Engineering (Biochemical) and (Chemical) is accredited with IChemE.

⁴ Students who complete the Computing major in the Bachelor of Design are eligible to enter the 237.5 point Master of Engineering (Software) or (Software with Business). Students who complete the Digital Technologies major in the Bachelor of Design are eligible to enter the 262.5 point Master of Engineering (Software) or (Software with Business).

⁵ The Master of Engineering (Mechanical with Aerospace) is a new course that was launched in 2019. The Melbourne School of Engineering will seek provisional accreditation for this course through Engineers Australia. The Melbourne School of Engineering has not yet sought accreditation with EUR-ACE®

BUILD A CAREER OF THE FUTURE AT MELBOURNE

Join the next generation of innovators, working towards a more productive and sustainable tomorrow. During your degree, you'll have access to internship and industry opportunities to help forge your career while you study. When you graduate, you'll benefit from international accreditation and be on your way to a global career in engineering and IT.

Gain real-world experience: industry collaboration

Our industry-connected curriculum means you'll have the opportunity to gain real-world experience during your degree. You could complete an industry project, take part in internships, undertake an innovation challenge with an industry mentor or connect with a STEM mentor.

Internships

The internship subject is available to domestic and international students in the Master of Engineering¹, Master of Information Technology and Master of Information Systems:

- » Undertake professional-level work experience for 10-16 weeks (approximately 320-350 hours²)
- » Gain credit towards your degree
- » Take part in workshops run by careers counsellors to improve your resume, develop your interview skills and enhance your employability for the future
- » Explore international and domestic internship opportunities related to your discipline and career goals

Industry connected curriculum

Undertake a design or research project with industry and apply your knowledge to help solve a real-world problem.

- » Undertake your project over the course of a semester, full-year or summer break
- » Develop a collaborative relationship with industry practitioners
- » Available in the Master of Engineering, Master of Information Technology and Master of Information Systems
- » Creating Innovative Engineering: undertake an innovation challenge with an industry mentor in this first-year Master of Engineering subject.

STEM Mentoring

Build professional networks, explore your career options and gain insight into the professional world of STEM with alumni mentors and industry professionals.

Other opportunities

- » Industry panels
- » Self-sourced internships
- » Industry guest lecturers
- » Networking events
- » Melbourne Accelerator Program
- » Case Competition
- » Endeavour Showcase

Skill building and workshops

Give your career a headstart with skill-building workshops tailored for engineering and IT students. Our employability team offers tips on perfecting your resume and cover letter, preparing for interviews and developing your personal brand and online presence.

With access to screened job listings, industry events and university-sourced internship opportunities, you'll be well positioned to enhance your employability and start forging your career while you study.

Clubs and societies

Our student clubs bring together people who are passionate about engineering and IT and want to make an impact. With over 200 clubs to choose from, you'll connect with people from a range of disciplines, cultural backgrounds and interests.

- » Aerospace and Robotics Society
- » Computing and Information Systems Students Association (CISSA)
- » Engineering Music Society
- » Engineers Without Borders
- » Melbourne University Engineering Student Club (MUESC)
- » MUR Motorsports
- » Robogals
- » Women in Science and Engineering (WISE)
- » Women in Technology

Build your portfolio while you study: student opportunities

As a Melbourne engineering or IT student, you'll have access to a broad range of opportunities to build your experience and employability while you study.

Global Mobility Program: Exchange and Study Abroad

Choose from short-term or semester-long programs, and focus on research projects that match your interests. You'll benefit from scholarships, bursaries and other funding opportunities.

Popular exchange destinations for engineering and IT students¹

North America:

- » University of California, Berkeley (USA)
- » University of Illinois at Urbana-Champaign (USA)
- » McGill University (Canada)
- » University of British Columbia (Canada)
- » University of Texas at Austin (USA)
- » New York University (USA)
- » Carnegie Mellon University (USA)

180 EXCHANGE
PARTNER INSTITUTIONS
ACROSS 39 COUNTRIES



Europe:

- » Delft University of Technology (Netherlands)
- » Lund University (Sweden)
- » Technical University of Munich (Germany)
- » Imperial College London (UK)
- » Swiss Federal Institute of Technology (ETH) Zurich (Switzerland)
- » Royal Institute of Technology (KTH) (Sweden)
- » University College London (UK)
- » King's College London (UK)

Asia:

- » Peking University (China)
- » Tokyo Institute of Technology (Japan)
- » Nanyang Technological University (Singapore)
- » National University of Singapore (Singapore)
- » KAIST (Korea Advanced Institute of Science and Technology) (South Korea)
- » University of Tokyo (Japan)
- » Tsinghua University (China)

A global career

Around the world, employers are looking to fill valuable STEM roles with people who have the right combination of technical and professional skills, including business and communication skills.

As a Melbourne graduate, you'll be equipped to meet today's challenges with strong business, technical and interpersonal skills. You'll enter the global workforce with the ability to lead projects and teams, and the creativity to analyse problems and develop innovative solutions.

Our alumni

38,000+ ALUMNI
IN MORE THAN
100 COUNTRIES



Resources:

- » Australian Government Job Outlook: joboutlook.gov.au
- » Careers and employability: careers.unimelb.edu.au
- » Engineers Australia: engineersaustralia.org.au
- » Graduate Careers: graduatecareers.com.au

For more detailed information about where our graduates work and what roles they are employed in, see the relevant course page.

¹ For a full list of institutions, visit programs.mobility.unimelb.edu.au/index.cfm

BIOMEDICAL ENGINEERING

Meet the health challenges of the future with a degree in biomedical engineering. As life expectancies increase, engineers, doctors and clinicians are working together to ensure our bodies can take us further than ever before.

What is biomedical engineering?

Biomedical engineers blend biomedical science with engineering techniques to create innovative healthcare solutions.

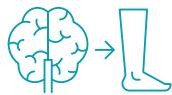
Our world-leading biomedical engineering research:



Bionic eye



Low-cost prostheses



Brain-computer interfaces



Bioprinting and tissue engineering

Get connected

Be exposed to world-class research through the Graeme Clark Institute for Biomedical Engineering, a community of engineers, scientists and clinicians in the healthcare system.

Receive one-on-one job and career mentorship from our industry partners, where you will be matched with an industry representative to gain career advice and job interview tips¹.



"I enjoy the workshops and practicals as it adds another layer of hands-on learning to my course. It gives me the opportunity to think outside the box and apply the lecture content to real life situations.

The internships I've completed so far have been great opportunities to gain work experience and get a taste of what life after university will be like."

Wenn Lynn Ooi, Master of Engineering (Biomedical with Business)

¹ Please note that internships and mentor opportunities are subject to company approval and availability.



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

At a glance:

 Duration: 2-3 years	 Intake: February (Sem 1), July (Sem 2)	 Designed for: Becoming an accredited biomedical engineer	 Accredited by: Engineers Australia and EUR-ACE	 Cost: CSPs available/full fee place guarantee
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- » Focus on human systems and the design and operation of devices and processes
- » Apply engineering skills to new medical treatments, instruments and machines
- » Learn from world leaders in medical bionics, human movement, prostheses, tissue engineering and more

Master of Engineering (Biomedical)

If you have not completed a major in biomedical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Biomedical)**:

Year 0	Sem 1	Foundation Selective	Applied Computation in Bioengineering	Mechanics for Bioengineering	Circuits and Systems
	Sem 2	Foundation Selective	Anatomy and Physiology for Bioengineering	Introduction to Biomaterials	Biosystems Design

If you have completed a major in biomedical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Biomedical)**:

Year 1	Sem 1	Biomechanics	Bioengineering Data Analytics	Bioinstrumentation	Biomedical Eng Management & Regulations
	Sem 2	Biofluid Mechanics	Biosignal Processing	Selective subject (CCE/CIE/CIP)	Bioengineering Elective
Year 2	Sem 1	Biomedical Engineering Capstone Project*	Bioengineering Elective	Bioengineering Elective	Approved Elective
	Sem 2		Bioengineering Elective	Bioengineering Elective	Approved Elective

Master of Engineering (Biomedical with Business)

If you have not completed a major in biomedical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Biomedical with Business)**:

Year 0	Sem 1	Foundation Selective	Applied Computation in Bioengineering	Mechanics for Bioengineering	Circuits and Systems
	Sem 2	Foundation Selective	Anatomy and Physiology for Bioengineering	Introduction to Biomaterials	Biosystems Design

If you have completed a major in biomedical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Biomedical with Business)**:

Year 1	Sem 1	Biomechanics	Bioengineering Data Analytics	Bioinstrumentation	Biomedical Eng Management & Regulations
	Sem 2	Biofluid Mechanics	Biosignal Processing	Engineering Contracts and Procurement	The World of Engineering Management
Year 2	Sem 1	Biomedical Engineering Capstone Project	Strategy Execution for Engineers	Economic Analysis for Engineers	Bioengineering Elective
	Sem 2		Bioengineering Elective	Bioengineering Elective	Marketing Management for Engineers

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

*BioDesign Innovation may be taken in place of Biomedical Engineering Capstone Project and two Bioengineering Electives

 Core subject

 Business subject

 Selective/
Elective

BIOMEDICAL ENGINEERING

Our student opportunities

Internships

- ↓
 - » Hospitals
 - » Biomedical industry

Student projects

↓
Design your own biomedical engineering instrumentation, from prosthetics to pacemakers, and use our state-of-the-art facilities to fabricate components.

Work on projects such as monitoring the vital signs of patients, a diagnostic tool for stent selection, speech recognition software and more.

Graduate employment opportunities

- ↓
 - » Hospitals (e.g. Royal Melbourne Hospital, Royal Children's Hospital, Epworth Healthcare)
 - » Biomedical Institutes (e.g. Bionics Institute, Walter and Eliza Hall Institute, St Vincent's Institute)
 - » Government agencies (e.g. CSIRO, Defence Science and Technology Group)
 - » Medical device companies (e.g. Cochlear, OMX Solutions, Seer Medical)

Where our graduates work

Industries

- ↓
 - » Biotechnology
 - » Finance
 - » Health Services
 - » Hospitals
 - » Medical Devices
 - » Government
 - » Information Technology
 - » Pharmaceuticals
 - » R&D
 - » Start-ups
 - » Consultancy

Companies

- ↓
 - » Accenture
 - » Agilent Technologies
 - » Bionics Institute
 - » Cerner Corporation
 - » Eastern Health
 - » GE
 - » IBM
 - » OMX Solutions
 - » Royal Children's Hospital
 - » Toshiba Medical Systems

Job roles

- ↓
 - » Analyst
 - » Clinical Engineer
 - » Design Engineer
 - » Field Service Technician
 - » Hardware Engineer
 - » Research Associate
 - » Service Engineer
 - » Startup Founder



**Commercialise
your medical device**

Develop a concept for a medical device and design a business plan through the BioDesign Innovation subject. Working with students from the Master of Business Administration (MBA) course and clinicians from Melbourne hospitals, you'll find an unmet clinical need, develop an engineering prototype and create a business plan to bring your medical device to market.

Our BioDesign Innovation success stories include NAVi Medical Technologies and Stelect, winners of Australia's largest medtech startup competition, Medtech's Got Talent.

CHEMICAL AND BIOCHEMICAL ENGINEERING



No.32 in the world for Chemical Engineering¹

With a degree in chemical or biochemical engineering, you'll help meet the world's growing need for food, energy and water, preserve the natural environment and develop solutions to provide large scale healthcare options for improved life on earth.

What is chemical and biochemical engineering?

Chemical engineering focuses on the design and development of chemical processes, and equipment, involved in waste management, manufacturing, health and food industries. Chemical engineers optimise and control processes for environmentally sustainable and economic industrial operations. Biochemical engineering utilises chemical engineering principles with a focus on biological processes within, for example, the dairy, pharmaceutical and renewable fuels sectors.

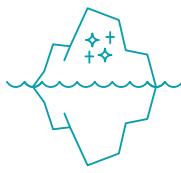
Examples of our world-leading chemical and biomedical engineering research:



Generating
renewable
energy from
algae and
biowaste



Improving
food
sustainability



Keeping
Antarctica
clean



Batteries
that last
longer

Learn from experts in nanotechnology, pharmaceuticals, minerals, materials, natural gas processing and solvent extraction.



Master of Engineering (Biochemical)

At a glance:

 Duration: 2-3 years	 Intake: February (Sem 1), July (Sem 2)	 Designed for: Becoming an accredited biochemical engineer	 Accredited by: Engineers Australia and EUR-ACE
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- » Discover how to design new bioproducts and bioprocesses
- » Apply your knowledge to areas such as food and beverage engineering, pharmaceuticals and cosmetics, and environmental remediation

Master of Engineering (Biochemical)

If you have not completed a major in biochemical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Biochemical)**:

Year 0	Sem 1	Reactor Engineering	Material and Energy Balances	Engineering Mathematics	Transport Processes
	Sem 2	Safety and Sustainability Case Studies	Chemical Process Analysis	Fluid Mechanics	Heat and Mass Transport Processes

If you have completed a major in biochemical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Biochemical)**:

Year 1	Sem 1	Creating Innovative Engineering	Chemical Engineering Thermodynamics	Bioprocess Engineering	Chemical Engineering Management
	Sem 2	Process Equipment Design	Process Dynamics and Control	Biochemical Engineering Research Project / Industry Project	
Year 2	Sem 1	Particle Mechanics and Processing	Process Engineering	Food Engineering	Biochemical Engineering Elective
	Sem 2	Biochemical Engineering Design Project		Biochemical and Pharmaceutical Engineering	Biochemical Engineering Elective

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

 Core subject

 Elective



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

At a glance:

 Duration: 2-3 years	 Intake: February (Sem 1), July (Sem 2)	 Designed for: Becoming an accredited chemical engineer	 Accredited by: Engineers Australia, EUR-ACE
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- » Focus on the invention, design and sustainable implementation of industrial-scale processes for converting raw waste materials into useful products
- » Apply your knowledge to areas such as fuel, plastics, food additives, fertilisers, paper and pharmaceuticals
- » Gain expertise in the computing and simulation of chemical processes

Master of Engineering (Chemical)

If you have not completed a major in chemical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Chemical):**

Year 0	Sem 1	Reactor Engineering	Material and Energy Balances	Engineering Mathematics	Transport Processes
	Sem 2	Safety and Sustainability Case Studies	Chemical Process Analysis	Fluid Mechanics	Heat and Mass Transport Processes

If you have completed a major in chemical engineering in your undergraduate degree, study the 2 year

Master of Engineering (Chemical):

Year 1	Sem 1	Creating Innovative Engineering	Chemical Engineering Thermodynamics	Bioprocess Engineering	Chemical Engineering Management
	Sem 2	Process Equipment Design	Process Dynamics and Control	Chemical Engineering Research Project / Industry Project	
Year 2	Sem 1	Particle Mechanics and Processing	Process Engineering		Advanced Heat and Mass Transport Processes
	Sem 2	Chemical Engineering Design Project		Chemical Engineering elective	Chemical Engineering elective

Master of Engineering (Chemical with Business)

If you have not completed a major in chemical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Chemical with Business):**

Year 0	Sem 1	Material and Energy Balances	Engineering Mathematics	Transport Processes	Reactor Engineering
	Sem 2	Safety and Sustainability Case Studies	Heat and Mass Transport Processes	Chemical Process Analysis	Fluid Mechanics

If you have completed a major in chemical engineering in your undergraduate degree, study the 2 year

Master of Engineering (Chemical with Business):

Year 1	Sem 1	Chemical Engineering elective	Bioprocess Engineering	Economic Analysis for Engineers	Chemical Engineering Thermodynamics
	Sem 2	World of Engineering Management	Process Dynamics and Control	Process Equipment Design	Engineering Contracts and Procurement
Year 2	Sem 1	Chemical Engineering Research Project / Industry Project		Process Engineering	Chemical Engineering elective
	Sem 2	Chemical Engineering Design Project		Strategy Execution for Engineers	Marketing Management for Engineers



"I work in energy efficiency for a consulting firm. Right now I'm managing two dairy sites, one sewage treatment and one fruit preserving company. Having a biochemical background has really helped me understand the processes behind each industry that I'm working in."

Sasha Finn

Master of Engineering
(Biochemical)
Energy Engineer, ERM Power

Where our graduates work

Industries

- » Bioremediation
- » Chemical Manufacturing
- » Consultancy
- » Cosmetics
- » Food and Beverage Production
- » Minerals and Energy
- » Oil and gas
- » Petrochemicals
- » Petroleum
- » Pharmaceuticals
- » R&D
- » Waste and Water Treatment

Companies

- » Arup
- » BHP Billiton
- » BP
- » Bulla Dairy Foods
- » Carlton & United Breweries
- » CSL
- » ExxonMobil
- » Fonterra Australia
- » GHD
- » Macquarie Group
- » Mars Chocolate Australia
- » Melbourne Water
- » Rio Tinto
- » Woodside
- » WorleyParsons

Job roles

- » Process Engineer
- » R&D Scientist
- » Quality Control Officer
- » Control System Engineer
- » Project Engineer
- » Chemical Engineer
- » Development Chemist
- » Production Engineer
- » Facilities Engineer
- » Technical Development Engineer
- » Supply Engineer
- » Operations Support Engineer
- » Manufacturing First Line Leader

Our student opportunities

Industry project

Use your newly developed technical skills to solve a specific industrial problem within one of our partner companies, in sectors including:

- » Pharmaceuticals
- » Pulp and Paper
- » Specialty Chemicals
- » Minerals Processing
- » Food and Beverage
- » Oil and Gas
- » Water and Wastewater Treatment

CIVIL AND STRUCTURAL ENGINEERING



No.15 in the world
for Civil and Structural
Engineering¹

Reimagine our cities in a growing world with a degree in civil or structural engineering. Prepare regions, cities and towns to handle increasing populations, finite resources and extreme events.

What is civil and structural engineering?

Civil engineering can cover a broad range of areas, such as transport, environmental and geotechnical engineering. Structural engineering is a specialised type of civil engineering that focuses on the design and maintenance of load-bearing structures.

Our world-leading civil and structural engineering research:



Prefabricated housing



Going underground
for green energy



How nanoclay stops cladding fires from spreading

Learn from researchers in the ARC Training Centre for Advanced Manufacturing and Prefabricated Housing, the Australia-China Joint Research Centre on River Basin Management, Centre for Disaster Management and Public Safety and more.



“I’m learning from high quality researchers recognised internationally for their expertise in high-rise structures and wind, wave, earthquake and impact resistant technologies. We are provided a series of design seminars, field work and workshops, with opportunities to work with industry professionals throughout the course.”

Shuangmin (Victor) Shi
Master of Engineering
(Structural)

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

At a glance:

	Duration: 2-3 years		Intake: February (Sem 1), July (Sem 2)		Designed for: Becoming an accredited civil engineer		Accredited by: Engineers Australia and EUR-ACE
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- » Strengthen your understanding of sustainable urban developments, environmental protection, resilient infrastructure design and the conservation of energy and water resources
- » Develop skills in structural, geotechnical, hydraulic and transportation engineering, as well as key knowledge in ports and harbour, energy, sustainability and project management
- » Special focus on sustainability design and environmental processes

Master of Engineering (Civil)

If you have not completed a major in civil engineering in your undergraduate degree, study the 3 year **Master of Engineering (Civil)**:

Year 0	Sem 1	Engineering Risk Analysis	Engineering Mechanics	Engineering Mathematics	Fluid Mechanics
	Sem 2	Earth Processes for Engineering	Engineering Materials	Systems Modelling and Design	Structural Theory and Design

If you have completed a major in civil engineering in your undergraduate degree, study the 2 year **Master of Engineering (Civil)**:

Year 1	Sem 1	Structural Theory and Design 2	Sustainable Infrastructure Engineering	Engineering Site Characterisation	Geotechnical Engineering
	Sem 2	Engineering Project Implementation	Civil Hydraulics	Transport Systems	Critical Communication for Engineers/ Creating Innovative Engineering/ Creating Innovative Professionals
Year 2	Sem 1	Engineering Capstone Project Part 1	Integrated Design (Infrastructure) / Integrated Design (Civil)	Civil Engineering elective	Civil Engineering elective
	Sem 2	Engineering Capstone Project Part 2	Construction Engineering	Civil Engineering elective	Civil Engineering elective

Master of Engineering (Civil with Business)

If you have not completed a major in civil engineering in your undergraduate degree, study the 3 year **Master of Engineering (Civil with Business)**:

Year 0	Sem 1	Fluid Mechanics	Engineering Risk Analysis	Engineering Mathematics	Engineering Mechanics
	Sem 2	Systems Modelling and Design	Structural Theory and Design	Engineering Materials	Earth Processes for Engineers

If you have completed a major in civil engineering in your undergraduate degree, study the 2 year **Master of Engineering (Civil with Business)**:

Year 1	Sem 1	Structural Theory and Design 2	Sustainable Infrastructure Engineering	Engineering Site Characterisation	Geotechnical Engineering
	Sem 2	Engineering Project Implementation	Civil Hydraulics	Transport Systems	Marketing Management for Engineers
Year 2	Sem 1	Strategy Execution for Engineers	Engineering Capstone Project Part 1	World of Engineering Management	Economic Analysis for Engineers
	Sem 2	Engineering Contracts and Procurement	Engineering Capstone Project Part 2	Integrated Design (Civil)	Construction Engineering

Master of Engineering (Structural)

At a glance:

 **Duration:**
2-3 years

 **Intake:**
01 February (Sem 1),
July (Sem 2)

 **Designed for:**
Becoming an accredited
structural engineer

 **Accredited by:**
Engineers Australia,
EUR-ACE

- » Learn to design, develop and evaluate materials and systems used in constructing load-bearing infrastructure, such as roads, bridges, buildings, railways or dams
- » Take part in 'Steel Week', where you'll work with an industry practitioner on a structural engineering project and gain insight into engineering consulting

Master of Engineering (Structural)

If you have not completed a major in structural engineering in your undergraduate degree, study the 3 year **Master of Engineering (Structural)**:

	Sem 1	Engineering Mathematics	Engineering Mechanics	Fluid Mechanics	Engineering Risk Analysis
Year 0	Sem 2	Earth Processes for Engineering	Engineering Materials	Structural Theory and Design	Critical Communication for Engineers / Creating Innovative Engineering / Creating Innovative Professionals

If you have completed a major in structural engineering in your undergraduate degree, study the 2 year **Master of Engineering (Structural)**:

Year 1	Sem 1	Structural Theory and Design 2	Sustainable Infrastructure Engineering	Engineering Site Characterisation	Geotechnical Engineering
	Sem 2	Engineering Project Implementation	Steel and Composite Structures Design	Systems Modelling and Design	Structural Engineering Elective
Year 2	Sem 1	Engineering Capstone Project Part 1	Integrated Design (Infrastructure) / Integrated Design (Civil)	Structural Engineering Elective	Structural Engineering Elective
	Sem 2	Engineering Capstone Project Part 2	Construction Engineering	Structural Engineering Elective	Structural Engineering Elective

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

 Core subject

 Elective

Where our graduates work

Industries	Companies	Job roles
↓	↓	↓
» Aerospace	» Transport	» Project Engineer
» Civil Engineering	» Utilities	» Site Engineer
» Construction	» Water Resources Engineering	» Geotechnical Engineer
» Geotechnical Engineering	» AECOM	» Structural Engineer
» Manufacturing	» Arup	» Civil Engineer
» Mining	» Aurecon	» Consultant
» Oil and Gas	» BHP Billiton	» Design Engineer
	» Boston Consulting Group	» Tunnel Engineer
	» City West Water	
	» GeoAust Geotechnical Engineers	
	» John Holland	
	» Melbourne Metro Rail Authority	
	» Multiplex	
	» Shell	



"I did the Bachelor of Commerce/Engineering pathway. Seeing aspects of both disciplines has been great. Having a background in commerce has really opened my options to both technical and managerial roles. I think I can use my knowledge for both aspects in engineering."

Kisal Weeratunge
Master of Engineering
(Structural)

Our student opportunities

Internships

- ↓
 - » Infrastructure
 - » Property
 - » Transport
 - » Electricity Distribution
 - » Built Environment
 - » Oil and Gas
 - » Engineering Consulting
 - » Project Management
 - » Construction

Student projects

- ↓

Work on projects such as estimating life loss from flood, the role of virtual reality in search and rescue or detecting bridge cracks with drones.



Master of Engineering Structures

At a glance:



Duration:
1 year program



Intake:
February (Sem 1),
July (Sem 2)



Designed for: Graduates and experienced civil and structural engineers who are seeking to advance skills and knowledge in engineering structures.

Learning outcomes

- » Explore key themes such as structural systems, conceptual design, sustainable design, extreme loading and advanced analysis techniques
- » Gain the skills to design ecologically sustainable and resilient structures
- » Learn the special requirements to successfully design high rise structures

- » Understand the procedures and processes for structural steel, coldformed steel, composites, timber or masonry structures

Student experience

- » Undertake an infrastructure engineering research subject and choose from a wide range of electives
- » Complete a simulated structural design exercise and collaborate with an experienced senior practising engineer

Our career outcomes

The Master of Engineering Structures is a specialised masters course, designed to help qualified engineers advance their career. This qualification prepares graduates for senior roles in structural engineering and related industries.

Sample course plan

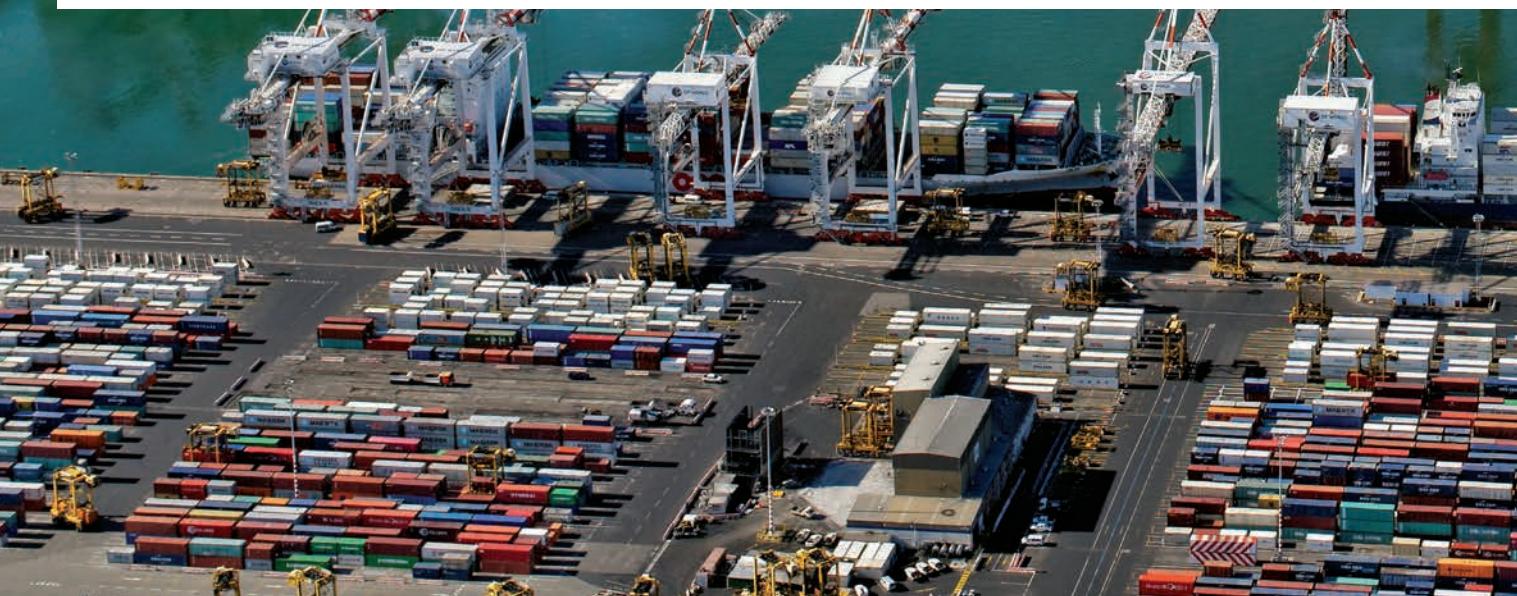
Year 1	Sem 1	High Rise Structures	Infrastructure Engineering elective	Structural Engineering elective	Structural Engineering elective
	Sem 2	Steel and Composite Structures Design	Structural Engineering elective	Infrastructure Engineering elective	Infrastructure Engineering elective

Core subject

Elective

Structural Engineering electives (choose at least 3)	Infrastructure Engineering electives (choose up to 3)
<ul style="list-style-type: none"> » Structural Resistant Design of Buildings » Extreme Loading of Structures » Concrete Design and Technology » Structural Dynamics and Modelling » Building Information Modelling 	<ul style="list-style-type: none"> » Sustainable Infrastructure Engineering » Quantitative Environmental Modelling » Solar Energy » Energy for Sustainable Development » Project Management Practices » Engineering Project Implementation » Geotechnical Applications » Energy Efficiency Technology

Sample plans are an indicative guide only and subjects may change. See <https://handbook.unimelb.edu.au/2020/courses/746st/>



Graduate Certificate in Port Engineering

At a glance:



Duration:
6 months full-time (1 sem) or 1 year part-time



Intake:
January (Summer), February (Sem 1), July (Sem 2)



Delivery: Intensive on-campus teaching and online assessments. Delivered in partnership with Ports Australia, with support from the Pilbara Ports Authority and the Bureau of Meteorology



Designed for:
Professionals practicing in the port and coastal engineering industry

Learning outcomes

- » Improve your capacity for port and harbour design and management
- » Strengthen your understanding of ship traffic in ports and harbours
- » Engage with a multidisciplinary overview of dredging issues
- » Apply technologies, concepts, methods and hydrodynamic theories in harbour facility planning, design and construction

Student experience

- » Undertake specialised coursework electives
- » Learn from world-leading scientists in the field of maritime engineering
- » Engage with industry through site visits
- » Developed in consultation with eminent practitioners in maritime, coastal and port engineering

Our career outcomes

This course prepares professionals for senior or specialised roles in the port and coastal engineering industry. Graduates will benefit from advanced knowledge and skills, enabling them to design and manage prominent ports and harbours.

Sample course plan

Year 1	Sem 1	Dredging Engineering	Port Access and Navigation (online)	Port and Harbour Engineering	Elective
--------	-------	----------------------	-------------------------------------	------------------------------	----------

Core subject Elective

Choose one elective from the following:

- | | |
|--|---|
| <ul style="list-style-type: none"> » Freight Systems » Building Information Modeling » Metocean Engineering | <ul style="list-style-type: none"> » Port Structural Design » Environmental Management ISO 14000 » Satellite Positioning Systems |
|--|---|

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/2020/courses/gc-porteng



ELECTRICAL AND ELECTRONIC ENGINEERING



No.36 in the world for Electrical Engineering¹

Electrical systems power our everyday lives, from energy efficient power grids to life-changing medical devices. Learn to design, build and improve these valuable systems with a degree in electrical engineering.

What is electrical and electronic engineering?

Electrical engineers design and manage the electrical systems used in automation, surveillance, energy conversion, power distribution, telecommunications and information processing. Electronic engineers focus on small-scale electronic systems, such as computers and integrated circuits.

Our world-leading electrical engineering research:



Bionic implants



Predicting epileptic seizures, just like the weather



Using lasers to help the blind see



Community microgrids to efficiently share renewable energy

Learn from leading experts in power systems, energy-efficient telecommunications systems and sensor networks that monitor the environment.



"I focused on Electrical Engineering as I saw it to be a challenge, that would help me progress toward the renewable energy industry, provide me computing experience and open myself to new opportunities. The project-based learning has been fantastic as it enables us to apply the theory we have learnt."

Inushka Dassanayake
Master of Engineering (Electrical)

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

At a glance:

 **Duration:**
2-3 years

 **Intake:**
February (Sem 1),
July (Sem 2)

 **Designed for:** Becoming
an accredited electrical
or electronic engineer

 **Accredited by:**
Engineers Australia
and EUR-ACE

» Acquire core skills in electronics, control, signal processing, communications and power systems

» Learn from leading experts in power systems, energy-efficient telecommunications systems and sensor networks that monitor the environment

Master of Engineering (Electrical)

If you have not completed a major in electrical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Electrical)**:

Year 0	Sem 1	Foundations of Electrical Networks	Engineering Mathematics	Engineering Computation	Digital Systems
	Sem 2	Electrical Device Modelling	Electrical Network Analysis and Design	Signals and Systems	Electronic System Implementation

If you have completed a major in electrical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Electrical)**:

Year 1	Sem 1	Probability and Random Models	Creating Innovative Engineering	Electronic Circuit Design	Introduction to Power Engineering
	Sem 2	Communication Systems	Signal Processing	Embedded System Design	Control Systems
Year 2	Sem 1	Electrical Engineering Capstone Project ¹	Electrical Engineering elective	Electrical Engineering Elective	Approved elective
	Sem 2		Electrical Engineering elective	Electrical Engineering elective	Approved elective

Master of Engineering (Electrical with Business)

If you have not completed a major in electrical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Electrical with Business)**:

Year 0	Sem 1	Foundations of Electrical Networks	Engineering Mathematics	Engineering Computation	Digital Systems
	Sem 2	Electrical Network Analysis and Design	Electrical Device Modelling	Signals and Systems	Electronic System Implementation

If you have completed a major in electrical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Electrical with Business)**:

Year 1	Sem 1	Probability and Random Models	Control Systems	Introduction to Power Engineering	Economic Analysis for Engineers
	Sem 2	Communication Systems	Electronic Circuit Design	Embedded System Design	Signal Processing
Year 2	Sem 1	World of Engineering Management	Strategy Execution for Engineers	Electrical Engineering Capstone Project	Electrical Engineering Elective
	Sem 2	Engineering Contracts and Procurement	Marketing Management for Engineers		Electrical Engineering Elective

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

1.BioDesign Innovation may be taken in place of Biomedical Engineering Capstone Project and two Bioengineering Electives

 Core subject

 Business subject

 Elective

ELECTRICAL AND ELECTRONIC ENGINEERING



Our student opportunities

Internships

- ↓
 - » Biotechnology
 - » Aerostructures
 - » Automation
 - » Technical consulting
 - » Power solutions
 - » Computing devices
 - » Telecommunications

Student projects

↓
Work on projects such as an accelerometer to measure football kicks, electric vehicles, smart metres, drones in disaster management and more.

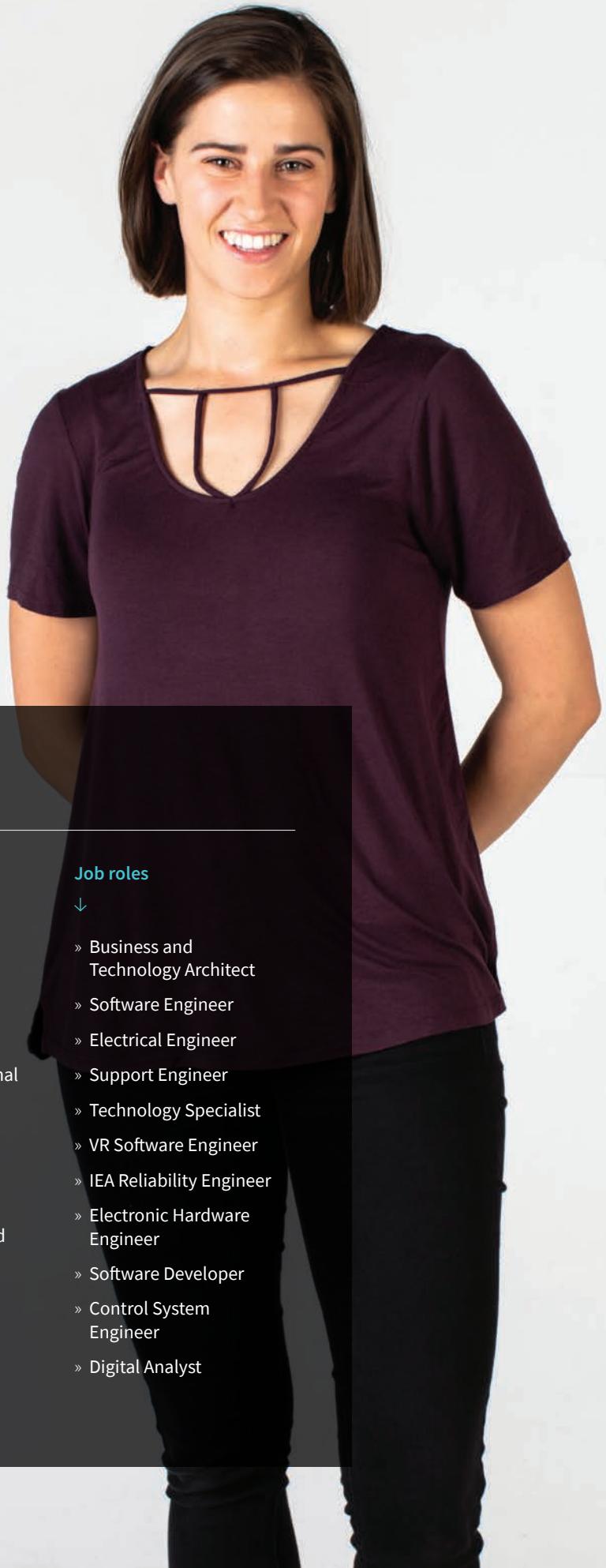


“Doing an internship helped me feel more confident and career-ready, because I learned how I would be using my technical skills in the work force.”

Olivia Panjkov

Master of Engineering
(Electrical)

Graduate Electrical Engineer
Snowy Hydro Limited



Where our graduates work

Industries

- ↓
 - » Automation
 - » Aviation
 - » Broadcast/Sound Engineering
 - » Electrical Equipment
 - » Electronics
 - » Power Generation and Transmission
 - » System Engineering
 - » Telecommunications

Companies

- ↓
 - » Accenture
 - » AECOM
 - » BHP
 - » Coles
 - » Daly International
 - » Deloitte
 - » ExxonMobil
 - » Google
 - » KPMG
 - » NBN Co. Limited
 - » Nokia
 - » Siemens
 - » Tesla
 - » Telstra
 - » Thales

Job roles

- ↓
 - » Business and Technology Architect
 - » Software Engineer
 - » Electrical Engineer
 - » Support Engineer
 - » Technology Specialist
 - » VR Software Engineer
 - » IEA Reliability Engineer
 - » Electronic Hardware Engineer
 - » Software Developer
 - » Control System Engineer
 - » Digital Analyst

ENERGY AND ENVIRONMENTAL ENGINEERING

Improve the liveability of our cities and sustainability of our resources with a degree in environmental engineering. Tackle the challenges we face in water shortage, climate change and waste management.

Become a leader in the energy sector. The Master of Energy Systems will provide you with the skills and knowledge required to implement the transition to a sustainable, least cost energy future.

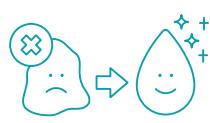
What is environmental engineering?

Environmental engineers design and build sustainable solutions to problems such as climate change, water scarcity, renewable energy and bushfire management.

Our world-leading environmental engineering research:



Exploring the birthplace of monster waves



Taking the sludge out of wastewater



Turning any water into drinking water



Digital vineyards

"I enjoyed the broad range of disciplines the course offered including water resource management, waste management and renewable energy. I was inspired and encouraged to apply my knowledge to real-life projects and to seek connections between theory and practice. I gained industry experience during my degree, working collaboratively with South East Water and Water Technology to solve real engineering problems."

Charles Lee

Master of Engineering (Environmental)

Engineer, Water Technology Pty Ltd

Our student opportunities

Internships

- ↓
- » Companies and government organisations specialising in water resources management
- » Environmental consulting and design
- » Construction
- » Weather forecasting

Student projects

- ↓
- Design and implement an environmental monitoring program, take part in a five-day field camp and engage with consultants who work on projects around the world.

Master of Engineering (Environmental)

At a glance:

 **Duration:**
2-3 years

 **Intake:**
February (Sem 1),
July (Sem 2)

 **Designed for:**
Becoming an accredited
environmental engineer

 **Accredited by:**
Engineers Australia
and EUR-ACE

Engineer solutions to the challenges facing our world in climate change, water resources, energy and bushfire management.

- » Design and build sustainable solutions to environmental problems
- » Focus on climate change, water scarcity and bushfire management

- » Develop a specialisation in energy, waste management or water resources

Master of Engineering (Environmental)

If you have not completed a major in environmental engineering in your undergraduate degree, study the 3 year **Master of Engineering (Environmental)**:

Year 0	Sem 1	Engineering Mechanics	Intro to Sustainable Water Systems	Fluid Mechanics	Analysis of Biological Data
	Sem 2	Environmental Engineering Systems Capstone	Earth Processes for Engineering	Engineering Mathematics	Critical Communication for Engineers / Creating Innovative Engineering

If you have completed a major in environmental engineering, study the 2 year **Master of Engineering (Environmental)**:

Year 1	Sem 1	Quantitative Environmental Modelling	Civil Hydraulics	Spatial Information Programming	International River Basin Management
	Sem 2	Monitoring Environmental Impacts	Environmental Analysis Tools	Engineering Hydrology	Environmental System Modelling and Design
Year 2	Sem 1	Engineering Capstone Project Part 1	Environmental Engineering Elective	Environmental Engineering Elective	Environmental Engineering Elective
	Sem 2	Engineering Capstone Project Part 2	Engineering Project Implementation	Environmental Engineering Elective	Environmental Engineering Elective

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

 Core subject

 Elective

Where our graduates work

Industries

- ↓
- » Catchment Management
- » Civil Engineering
- » Conservation and Natural Resources
- » Renewable Energy
- » Infrastructure Engineering

Companies

- ↓
- » Energy
- » Mining
- » Resource Planning and Management
- » Oil and Gas
- » Waste and Water Resources
- » Acciona Australia
- » Alluvium Consulting
- » Bureau of Meteorology
- » Department of Environment, Land, Water and Planning
- » Golder Associates
- » Jacobs
- » Melbourne Water
- » North Sumatra Hydro Energy
- » Water Tech
- » Woodside Energy

Job roles

- ↓
- » Application Engineer
- » Environmental Engineer
- » Consultant
- » Project Environmental Engineer

Master of Environmental Engineering

At a glance:

 Duration: 1 year program (part-time available)	 Intake: February (Sem 1), July (Sem 2)	 Designed for: Accredited engineers
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Gain advanced knowledge in sustainable development and environmental management.

Learning outcomes

- » Gain expertise in air pollution, cleaner production, environmental management systems, noise, vibration and more
- » Understand the complexities of decision-making from a political, legal and economic perspective

Our career outcomes

The Master of Environmental Engineering is a specialised masters course, designed to help qualified engineers change their field of work or advance their career. This qualification prepares graduates for senior roles in environmental engineering and related industries.

Sample course plan

Year 1	Sem 1	Quantitative Environmental Modelling	Intro to Sustainable Water Systems	Selective	Selective
	Sem 2	Monitoring Environmental Impacts	Environmental Analysis Tools	Selective	Approved elective

 Core subject  Selective / Elective

Choose 3-4 electives from one of the following themes:

Waste management	Energy	Water resources
<ul style="list-style-type: none"> » Energy from Biomass and Wastes » Engineering Risk Analysis » Infrastructure Engineering Research Project » Solid Wastes to Sustainable Resources » Water and Waste Water Management 	<ul style="list-style-type: none"> » Energy Efficiency Technology » Energy for Sustainable Development » Energy from Biomass and Wastes » Infrastructure Engineering Research Project » Solar Energy » Sustainable Buildings 	<ul style="list-style-type: none"> » Applied Environmental Hydraulics » Applied Hydrological Solutions » Infrastructure Engineering Research Project » Water and Waste Water Management » Water Resources Management Under Climate Change » Water Sensitive Urban Design

Or, choose one approved elective, such as:

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> » Remote Sensing » Foundations of Spatial Information » Information Visualization » Advanced Imaging | <ul style="list-style-type: none"> » Applications in Precision Agriculture » Project Management Practices » Engineering Contracts and Procurement » Metocean Engineering | <ul style="list-style-type: none"> » Port Access and Navigation » Dredging Engineering » Leadership for Innovation » Internship |
|---|--|---|

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/2020/courses/mc-engsys



Master of Energy Systems

At a glance:



Duration:
1.5 years



Intake: February
(Semester 1) only



Designed for: Graduates and professionals with a commerce, science or engineering undergraduate degree

Tackle emerging energy issues and guide critical decision-making in the energy sector.

Learning outcomes

- » Analyse energy systems from technical, commercial and policy standpoints
- » Explore energy finance, economics, energy markets and the operation of renewable and non-renewable energy systems

- » Learn from specialists in electricity generation, the transport sector, energy network design, sustainability and efficiency

Sample course plan

Year 1	Sem 1	Introduction to Energy Systems	Analysing Energy Systems	Electrical Power Systems	Financial Management
	Sem 2	Non-Renewable Energy	Renewable Energy	Managerial Economics	Elective
Year 2	Sem 1	Energy Supply and Value Chains	Elective	Elective	Elective

Core subject

Elective

In the Master of Energy Systems, you'll complete eight compulsory core subjects and four electives taken over 1.5 years (or part-time equivalent). Choose from a broad range of electives, including the Energy Systems Project and subjects from:

Energy and sustainability	Energy, finance and policy	The business of energy	Energy and law
<ul style="list-style-type: none"> » Adapting to Climate Change » Climate Change Mitigation » Climate Modelling and Climate Change » Environmental Modelling » Sustainable Buildings » Solar Energy » Sustainable Infrastructure Engineering 	<ul style="list-style-type: none"> » Climate Change Politics and Policy » Engineering for Public Policy » Environmental Policy Instruments » Project Finance » Sustainability Accounting 	<ul style="list-style-type: none"> » Business Analysis and Decision Making » Engineering Contracts and Procurement » Optimisation for Industry » Supply Chain Management » Transport Systems 	<ul style="list-style-type: none"> » Construction Law » Energy Regulation and the Law

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/2020/courses/206ec/

Where our graduates work

Industries

- ↓
- » Automotive
- » Demand Response
- » Network Optimisation
- » Renewable Energy
- » Solar Energy
- » Thermal Energy
- » Transport
- » Virtual Power Plant Design

Companies

- ↓
- » AEMO
- » AGL
- » Energy Australia
- » FlowPower
- » GreenSync
- » Jacobs
- » Pacific Hydro
- » Powershop/ Meridian Energy
- » Siemens
- » Tesla
- » West Wind

Job roles

- ↓
- » Project Manager
- » Associate Systems Engineer
- » Development Manager
- » Consultant
- » Executive Engineer
- » Senior Engineer
- » Project Mechanical Engineer
- » Business Evaluation Manager
- » Principal Engineer
- » Analyst
- » Co-founder

Our student opportunities

Energy Systems Project

- ↓
- Work onsite at an organisation over three months, solving a real energy problem, forging industry connections and undertaking cross-disciplinary analysis. Outstanding students (average mark >75%) will be eligible for the Energy Systems Project program, a 1-semester placement onsite at a leading energy organisation, solving real energy industry problems, forging industry connections and undertaking cross-disciplinary analysis.

ENGINEERING MANAGEMENT AND BUSINESS

Master of Engineering Management

At a glance:

 Duration: 1 year program	 Intake: February (Sem 1), July (Sem 2)	 Designed for: Accredited engineers
--	--	--

Fast-track your career in management, gain expertise in navigating organisational change and leading projects to achieve tangible results.

» Developed in collaboration with Melbourne Business School

Learning outcomes

- » Take the next step in your career
- » Enhance your technological problemsolving skills
- » Gain business skills to manage people, projects and resources in complex organisation settings

Undertake the **Change Management stream** to understand the legal, commercial, marketing and personnel issues that managers encounter in a technical environment.

Undertake the **Project Management stream** to advance your understanding of project procurement, team leadership, risk management, communication, financial management and human resources.

Sample course plan

In the Master of Engineering Management, you'll complete eight subjects over one year (or part-time equivalent).

Year 1	Sem 1	Project / Change Management Subject	Project / Change Management Subject	Elective from the Master of Management	Elective from the Master of Management
	Sem 2	Strategic Management	Engineering Management Capstone	Project / Change Management Subject	Elective from the Master of Management

 Core subject

 Project/Change Management subject

 Elective

All students complete the core subjects Engineering Management Capstone and Strategic Management. Of the remaining subjects, you'll choose:

- » Three subjects from the Change and/or Project Management stream (you can either focus on one stream, or take a combination of subjects from both streams)

» Four subjects from the Master of Management, taught by Melbourne Business School

Project Management Subjects	Change Management Subjects	Electives
<ul style="list-style-type: none"> » Sustainable Infrastructure Engineering » Project Management Practices » Engineering Project Implementation » Engineering Contracts and Procurement » Transport System Modelling 	<ul style="list-style-type: none"> » Management and Leadership for Engineers » Building Information Modelling » Managing Change for IS Professionals » Engineering Entrepreneurship 	<ul style="list-style-type: none"> » Supply Chain Management » Management Competencies » Accounting for Decision Making » Business Analysis and Decision Making » Financial Management » Managerial Economics » Operations » Managing People

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/2020/courses/761em

Master of Engineering (with Business)



Designed for:

Becoming professionally accredited engineer

The Master of Engineering (with Business) is available in six specialisations: Biomedical, Chemical, Civil, Electrical, Mechanical and Software. To take a 'with Business' specialisation in the Master of Engineering, you'll replace five technical subjects with management subjects. See the relevant Master of Engineering page for sample course plans.



"By participating in business and technology workshops, I have had the chance to talk with industry and research experts. The professors challenge us to think more broadly through business case analyses. At the beginning of my master's degree, I just wanted to improve my personal and technical skills in project management. Now I want to develop and launch my own business in blockchain technology."

Johanna Rojas
Master of Engineering
Management

Where our graduates work

Industries

- ↓
 - » Product Development
 - » Manufacturing
 - » Construction
 - » Design Engineering
 - » Industrial Engineering
 - » Software Engineering
 - » Telecommunications

Companies

- ↓
 - » Accenture
 - » Barclays Corporate Banking
 - » Cisco
 - » Inventec
 - » Jetstar Airways
 - » Komatsu
 - » KPMG
 - » Melbourne Metro Rail Authority
 - » Rio Tinto
 - » Shell
 - » Telstra
 - » Thales
 - » Unilever

Job roles

- ↓
 - » Operations Coordinator
 - » Reliability Engineer
 - » National Proposals Coordinator
 - » Automotive Program Manager
 - » Configuration Management Coordinator
 - » Consultant
 - » Business Analyst
 - » Programmatic and Data Intelligence Manager

Our student opportunities

Student Experience

- ↓
 - » Learn from world-leaders from Melbourne Business School and collaborate with students from their masters programs
 - » Engage with industry through guest lectures and site visits
 - » Analyse business cases relevant to decision making and practice in engineering management

INDUSTRIAL ENGINEERING



No.1 in Australia
for mechanical,
aeronautical and
manufacturing
engineering.¹

With a degree in industrial engineering, you'll gain skills to improve processes, services and systems.

Develop a comprehensive skillset in manufacturing technologies, systems and simulation and advanced manufacturing and operations techniques, along with business management.

What is industrial engineering?

Industrial engineering is the branch of engineering that involves figuring out how to make or do things better. Industrial Engineers look at how to improve processes or design things that are more efficient and waste less money, time, raw materials, person-power and energy while achieving customer requirements and meeting regulatory obligations. They use knowledge and skills in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design for almost every industry sector from manufacturing to technology, service, and healthcare.

Our world-leading industrial engineering research:



Sustainable
manufacturing
and life cycle
engineering



Digital
transformation
in industry



Supply chain
integrity and
reliability



Innovative and
integrated design
for manufacturing

Wen Li
Course Coordinator

"We designed this course to offer future industrial engineers the comprehensive knowledge and tools to design and produce, and to understand how to operate and manage. These skills are applicable to a wide range of industries. The course consists of a mix of traditional and new subjects covering digital manufacturing, data analysis, sustainable engineering and life cycle approaches, complemented by business subjects. Theoretical learning is reinforced with hands on practice through a structure of knowledge development, hands on experience and industrial grounding."

Master of Industrial Engineering

At a glance:



Duration:
2 years



Intake: February (Semester 1),
July (Semester 2)



Designed for: Becoming an accredited
Industrial Engineer[^]

- » Gain experience through real-world projects and an industry connected curriculum to consolidate your theoretical knowledge
- » Undertake an industry, design or research project and gain the skills and knowledge to practice as a professional engineer
- » Be prepared for a career in a wide range of industries from manufacturing and processing to healthcare systems, banking and consulting

Sample course plan

Year 1	Sem 1	Creating Innovative Engineering	Design and Manufacturing Practice	Manufacturing Processes and Technology	Industrial Engineering
	Sem 2	Industrial Systems and Simulation	Operations and Process Management	Probability, Reliability and Quality	Manufacturing Automation and IT
Year 2	Sem 1	Engineering Capstone Project Part 1	Optimisation for Industry	Sustainable and Life Cycle Engineering	Economic Analysis for Engineers
	Sem 2	Engineering Capstone Project Part 2	Supply Chain Management	Industry Digital Transformation	Engineering Contracts and Procurement / Strategy Execution for Engineers/ The World of Engineering Management

Core subject

Selective

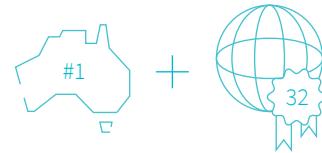
Sample plans are an indicative guide only and subjects may change.

[^]Provisional accreditation with Engineers Australia will be sought in 2021, with full accreditation sought in 2023 or 2024 after the course has had sufficient graduates. Full accreditation will be backdated to cover all students who entered the program from 2021.



INFORMATION TECHNOLOGY AND SOFTWARE ENGINEERING

Transform the future of business, health, communication and entertainment with a degree in IT or software engineering from Melbourne.



No.1 in Australia and No.32 in the world for Computer Science and Information Systems¹

Gain expertise in areas including:

- » Information systems
- » Human-computer interaction
- » Software engineering
- » Cybersecurity
- » Artificial intelligence
- » Data science
- » Machine learning
- » Spatial information

Our world-leading computing and information systems research:



Ageing in a virtual world



Insertable technology



Digital connectivity, crime and privacy



Greener cloud computing

Which IT degree is right for me?

Program name	What it's all about?	Your career goal
Master of Engineering » Software » Software with Business	Produce and manage large and small-scale software systems	Become an accredited software engineer
Master of Information Technology	Gain advanced technical skills and knowledge in IT	Pursue a technical IT career or advance your current IT skills
Master of Information Systems	Support, manage and change business processes through ICT	Pursue or advance your career in digital business
Master of IT Management (Executive)	Gain strategic expertise to influence decision-making at the most senior level	For senior IT executives seeking to take the next step in their career
Master of Data Science	Build advanced skills in statistical tools, techniques and methods	Pursue a career as a data scientist, software engineer or business intelligence analyst
Master of Computer Science	Research training program	Pursue a graduate research degree, or a career as a computational research specialist

¹ QS World University Rankings by Subject 2020



"I chose Information Systems at the University of Melbourne because of the course structure and the high ranking of the course. The core subjects have been organised perfectly in a way that the students get a clear idea of what it's like to be an Information Systems professional."

Linda Joy Thomas

Master of Information Systems



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

At a glance:

 Duration: 2-3 years	 Intake: February (Sem 1), July (Sem 2)	 Designed for: Becoming an accredited software engineer	 Accredited by: Engineers Australia and EUR-ACE, Euro-Inf, Australian Computer Society
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- » Learn how to produce and manage large and small-scale software systems, leveraging your mathematical, scientific and technical knowledge
- » Specialise in algorithms, internet technologies and database systems
- » Gain expertise in artificial intelligence, machine learning, cloud computing, cryptography, parallel computing and more

Master of Engineering (Software)

If you have not completed a major in computing or software engineering in your undergraduate degree, study the 3 year **Master of Engineering (Software):**

Year 0	Sem 1	Object Oriented Software Development	Database Systems	Computer Systems	CIS elective
	Sem 2	Design of Algorithms	Software Modelling and Design	Models of Computation	CIS elective

If you have completed a major in computing or software engineering in your undergraduate degree, study the 2 year **Master of Engineering (Software):**

Year 1	Sem 1	Software Requirements Analysis	Software Processes and Management	Critical Communication for Engineers / Creating Innovative Engineering	CIS Foundation elective
	Sem 2	Masters Software Engineering Project	Software Testing and Reliability	CIS Advanced elective	CIS Advanced elective
Year 2	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	CIS Advanced elective

Master of Engineering (Software with Business)

If you have not completed a major in Computing and Software Systems in your undergraduate degree, study the 3 year **Master of Engineering (Software with Business):**

Year 0	Sem 1	Database Systems	Design of Algorithms	Object Oriented Software Development	CIS elective
	Sem 2	CIS elective	CIS elective	Software Modelling and Design	Models of Computation

If you have completed a major in Computing and Software Systems in your undergraduate degree, study the 2 year **Master of Engineering (Software with Business):**

Year 1	Sem 1	Software Requirements Analysis	Computer Systems	Software Processes and Management	The World of Engineering Management
	Sem 2	Masters Software Engineering Project	Software Testing and Reliability	Marketing Management for Engineers	Engineering Contracts and Procurement
Year 2	Sem 1	Masters Advanced Software Project	High Integrity Systems	Modelling Complex Software Systems	Economic Analysis for Engineers
	Sem 2		Software Design and Architecture	Strategy Execution for Engineers	CIS Advanced elective



The soft skills I've learnt such as teamwork, leadership and communication have been awesome. On the more technical side, the University has given me a very strong grasp of computer science and engineering fundamentals that I can use as a basis for the rest of my career."

Sam Webster
Master of Engineering (Software)
Bachelor of Science

Our student opportunities

Internships



- » Banking and finance
- » Human-computer interaction
- » Consulting
- » Health

Student projects



Work in teams to develop and deliver a software solution for industry clients in a year-long industry project experience.

Where our graduates work

Industries

- » Aerospace
- » Games and Entertainment
- » Cybersecurity
- » Disaster Management
- » Energy and Commodities
- » Financial Services
- » Healthcare
- » Telecommunications
- » Traffic and Transport

Companies

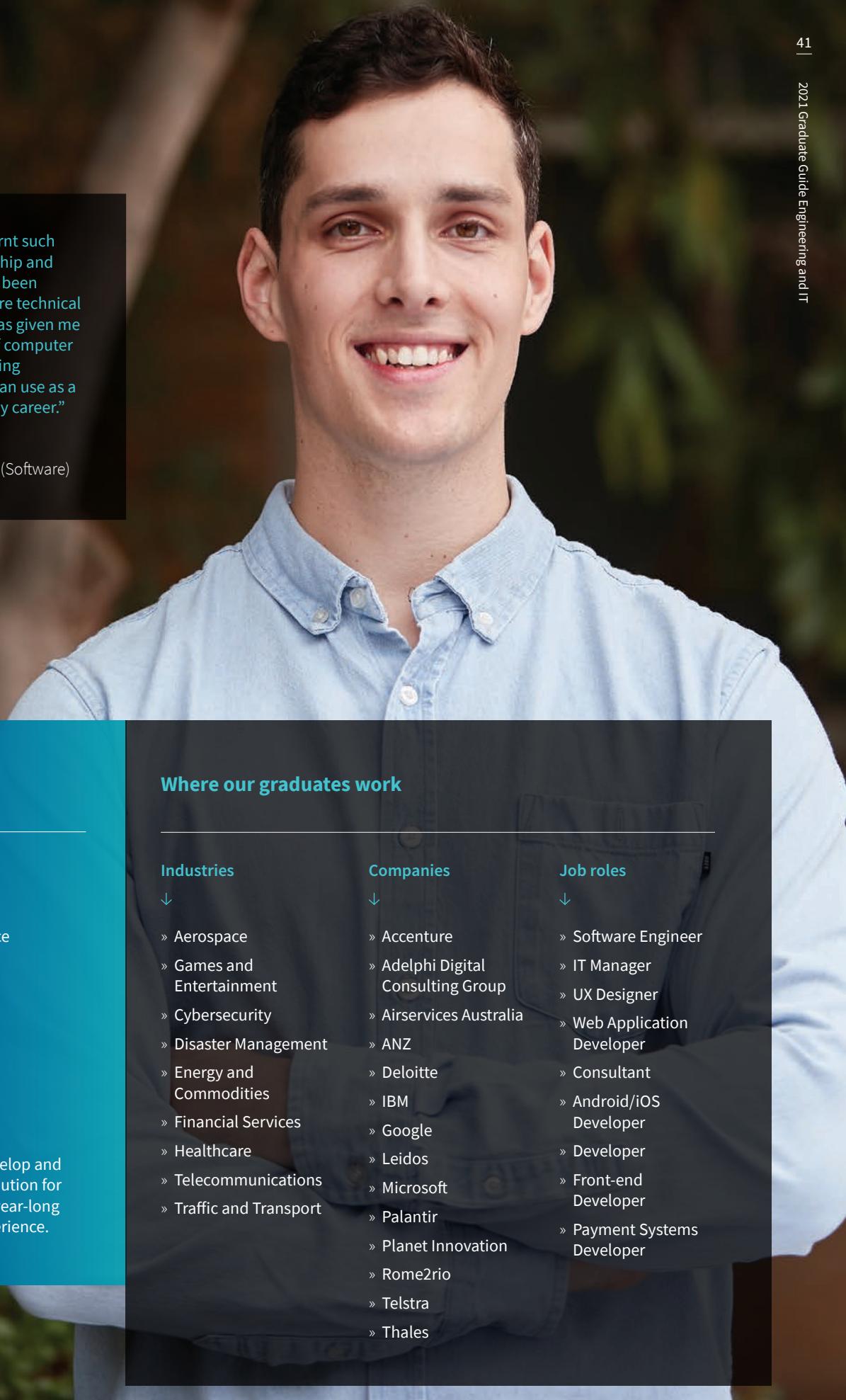


- » Accenture
- » Adelphi Digital Consulting Group
- » Airservices Australia
- » ANZ
- » Deloitte
- » IBM
- » Google
- » Leidos
- » Microsoft
- » Palantir
- » Planet Innovation
- » Rome2rio
- » Telstra
- » Thales

Job roles



- » Software Engineer
- » IT Manager
- » UX Designer
- » Web Application Developer
- » Consultant
- » Android/iOS Developer
- » Developer
- » Front-end Developer
- » Payment Systems Developer



Master of Information Technology

At a glance:



Duration: 1-2 years (depending on prior study and work experience)



Intake: February (Sem 1), July (Sem 2)



Designed for: Students with some programming background who want to qualify as an IT professional. Caters equally to students with a limited IT background and those with strong experience in the domain.



Accredited by: The Australian Computer Society (ACS)¹

Gain advanced technical skills and explore fast-changing areas of IT such as artificial intelligence, cybersecurity, machine learning, deep learning, data mining, urban systems and smart cities.

- » Gain the knowledge and experience to lead IT innovation that can be applied to business, government, health, entertainment and more
- » Grow your skills in IT project and change management, risk management, quality assurance and testing

- » Develop fundamental technical skills that will remain valuable as new technologies emerge

Sample course plan

Year 1	Sem 1	Programming and Software Development	Algorithms and Complexity	Internet Technologies	Database Systems and Information Modelling
	Sem 2	Specialisation Subject	Specialisation Subject	Specialisation Subject	Specialisation Subject
Year 2	Sem 1	Advanced Specialisation Subject	Advanced Specialisation Subject	Advanced Specialisation Subject	Advanced Specialisation Subject
	Sem 2	Advanced Specialisation Subject	Advanced Specialisation Subject	Capstone Project	

● Core subject

● Specialisation subject

● Advanced specialisation subject

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/2020/courses/mc-it



Choose one of the following specialisations, tailoring your program to suit your interests and career goals:

Specialisation	Overview	Focus on	Career opportunities
Artificial intelligence	Develop expertise in the design, implementation and analysis of systems that learn, plan and reason.	<ul style="list-style-type: none"> » Knowledge representation and planning » Machine learning » Data mining » Digital ethics » Security analytics 	<ul style="list-style-type: none"> » Artificial Intelligence, machine learning and data science » Deep learning » Data mining » Business and data analytics
Computing	Design, implement and evaluate IT projects and future needs.	<ul style="list-style-type: none"> » Theoretical and applied computing » Software development » Algorithmics » Databases and networking » IT project and change management 	<ul style="list-style-type: none"> » Data science » Data mining » Business and data analytics » Database, web or app development
Cybersecurity	Discover how to create new technologies to improve existing security and minimise vulnerability in design systems.	<ul style="list-style-type: none"> » Software vulnerability discovery » Cryptography » Secure systems design and verification » Security analytics 	<ul style="list-style-type: none"> » Security analytics, software and auditing » Cryptography » Forensics » Incident response » Network security
Distributed computing	Learn to manage large quantities of data through networked computers.	<ul style="list-style-type: none"> » Mobile computer systems programming » Cloud computing » High performance computing » Distributed algorithms » Parallel computing 	<ul style="list-style-type: none"> » eBusiness and cloud computing » Mobile systems programming » Sensor networks
Human-computer interaction	Evaluate interactive technologies and learn how to create the next generation of interfaces.	<ul style="list-style-type: none"> » User experience » Interaction design » Social computing » Information architecture » Ubiquitous computing 	<ul style="list-style-type: none"> » UI development and engineering » VR, AR web and other IT product design
Spatial	Analyse, communicate and visualise spatial information.	<ul style="list-style-type: none"> » Spatial databases » Spatial programming » Mapping and spatial services » Satellite positioning » Remote sensing 	<ul style="list-style-type: none"> » Urban systems and smart cities » Location-based apps » Infrastructure and transport » Disaster management and response » Policy and government

You'll also choose elective subjects to complement your area of specialisation, which includes the opportunity to undertake an internship or industry placement, or complete industry-based project.



"I worked with talented people and learned a lot from them. In each group project, I had the chance to lead the team and developed my leadership skills, which is essential in my current role."

PoSung Chen
Master of Information
Technology

Software Engineer, Amazon Web
Services (AWS)



Where our graduates work

Industries	Companies	Job roles
» Business	» Accenture	» Python Developer
» Financial Services	» Alacatel-Lucent	» Data Infrastructure Engineer
» Games and Entertainment	» ANZ	» Project Manager
» Health	» Apollo Medical Imaging Technology	» Software Engineer/Developer
» Media and Social Media	» Bitcoin Group	» Android/iOS Developer
» Technology R&D	» Blockchain Global Ltd	» Quantitative Analyst
» Telecommunications	» Centre for Eye Research Australia (CERA)	» Data Scientist
	» Cyberinc	» Front-end Developer
	» Data Solutions Group	» Algorithm Engineer
	» National Australia Bank	» Web Developer
	» PwC	» Virtual Reality Developer
	» Sina Com Technology	» Big Data Engineer
	» Suncorp Group	» Programmer
	» Telstra	» IT Consultant
		» Business Intelligence Consultant

Our student opportunities

Internships

- » Finance and banking
- » Telecommunications
- » Construction
- » Biotechnology
- » Startups

Student experience

Choose from electives in bioinformatics, database systems, enterprise computing, machine learning and artificial intelligence, programming languages, statistics, security and more.

¹ The Master of Information Technology (Spatial) is also accredited with the Royal Institution of Chartered Surveyors.

Master of Information Systems

At a glance:

 Duration: 1-2 years (depending on prior study and work experience)	 Intake: February (Sem 1), July (Sem 2)	 Designed for: Students from any undergraduate background	 Accredited by: The Australian Computer Society (ACS)
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Develop advanced capability in supporting, managing and changing business processes through information and communication technology (ICT).

- » Develop expertise in project and change management, emerging technologies, IT strategy and governance, security and service provision
- » Choose from one of three specialisations: professional, health or research
- » Learn transferable skills in problem solving, collaboration and project management
- » Build working relationships with clients in the subject Professional IS Consulting

Choose your specialisation

In the Master of Information Systems, you'll take a range of core subjects exploring IT and its impact on how we do business.

Professional	Health	Research
Build skills to further your career in IT management and digital business. Explore topics as database systems, organisational processes, app development, consulting, business analysis, emerging technologies and IT strategy and governance.	Leverage technology to improve health outcomes in healthcare service provision, public health and biomedical research. You'll focus on reducing preventable clinical errors and managing cost pressures in healthcare. Work as a health informatician, health IT consultant, medical research data manager or digital and mobile health solution developer in health agencies, biomedical research institutes and ehealth organisations.	Pursue a career in research undertaking an original investigation into a pressing IT issue with the Information Systems Major Research Project.

Electives

Choose up to four electives, focusing on areas such as:

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> » Industry experience, including an internship, industry placement or industry project » Information technology change management | <ul style="list-style-type: none"> » IT service provision » Business analytics » IT innovation and interaction design » Management | <ul style="list-style-type: none"> » Accounting and finance » Human resources, operations and marketing » Spatial information » Health |
|--|--|--|

Master of IT Management (Executive)

At a glance:

 Duration: 1 year	 Delivery: 100% online	 Intakes: February, April, July, October	 Designed for: Students from any undergraduate background
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Gain advanced capability in supporting, managing and changing business processes through information and communication technology.

- » Gain strategic expertise to influence decision-making at the most senior level
- » Acquire advanced collaborative skills to manage complex teams
- » Connect with an extensive network of high-achieving peers from a variety of industries
- » Develop advanced knowledge in emerging technologies, entrepreneurship, business analytics and enterprise architecture applications

For more information visit
online.unimelb.edu.au



"I chose the Master of Information Systems because it puts you at the front of managing emerging technology and making businesses work with it.

Information Systems excites me because I have gained a perspective on technology and businesses through the lens of managing both parts concurrently and what it takes to successfully combine the two."

Ngei Ning Lau

Master of Information Systems

Associate Systems Engineer
Cisco



Our student opportunities

Internships

- ↓
- » Startups
- » Non-profit sectors
- » Major Australian firms
- » Multinationals

Student experience

- ↓
- Gain professional practice knowledge of real-world IT management through industry links and guest lectures.

Where our graduates work

Industries

- ↓
- » Business
- » Financial Services
- » Games and Entertainment
- » Health agencies and healthcare services
- » Media and Social Media
- » Technology R&D
- » Telecommunications

Companies

- ↓
- » AGL Energy
- » Amazon
- » American Express
- » ANZ
- » Deloitte
- » Didi Chuxing
- » EY
- » Korea Computer & Systems Inc
- » KPMG
- » National Australia Bank
- » Nielsen
- » Outware Mobile
- » PayPal
- » Protiviti
- » PwC
- » Qantas
- » Suncorp Group
- » Sydney Opera House
- » Telstra

Job roles

- ↓
- » Financial Services Manager
- » Business Systems Analyst
- » IT Solution Lead
- » Front-end Developer
- » Agile Delivery Manager
- » Analyst
- » Data Engineer
- » Consultant
- » Technology Specialist
- » Data and Analytics Manager
- » Solution Architect
- » Application Developer
- » Project Manager

Master of Data Science

At a glance:

 **Duration:** 2 years

 **Intake:** February (Sem 1) only

 **Designed for:** Students with a background in data science, computer science or statistics

Keen to try a career in data analytics? Combine data science, computer science and statistics in a single coordinated program.

- » Develop the technological abilities and analytical skills to manage and gain insights from large and complex collections of data
- » Acquire skills in using statistical tools, techniques and methods
- » Use in-depth analysis and evaluation to solve real-problems with data

The Master of Data Science opens career opportunities as data scientists, business analysts, data engineer, climate and weather forecaster or data analyst. Graduates may find employment with Microsoft, Bureau of Meteorology, ANZ Bank, BHP Billiton, Boeing and more. Graduate Diploma of Data Science also available.

Master of Science (Bioinformatics)

At a glance:

 **Duration:** 2 years

 **Intake:** February (Sem 1), July (Sem 2)

 **Designed for:** Students with an interest in bioinformatics

Seeking a pathway to PhD study or a technical role in industry? Combine biology and IT, blending genetics, molecular biology, biochemistry and physiology with computer science, statistics and applied mathematics.

- » Learn from and work with high-profile researchers and practitioners in the heart of the Parkville Biomedical Precinct
- » Undertake a significant research project

Access career opportunities in medical research institutes and hospitals, government, research-focused companies and academic institutions, with examples including IBM, CSL, Melbourne Bioinformatics, Nectar and RDS. The Master of Science is also a pathway to a PhD or further research.





“The University of Melbourne has excellent networks with industry meaning that there are many opportunities to develop my future career path and receive advice from top companies in the industry.

I have enjoyed the creativity and innovation of the Master of Information Technology. The design of each subject has empowered me to think outside of the box, and develop a problem-solving mindset, professional standards, critical thinking and teamwork skills.”

Ziping (Pamela) Gao

Master of Information Technology
Bachelor of Commerce



Master of Computer Science

At a glance:



Duration:
2 years



Intake: February (Sem 1),
July (Sem 2)



Designed as:
Research pathway

Keep up with the rapid advances in the field of computer science while completing a major research project on your pathway to PhD study or a research-oriented industry position.

The Master of Computer Science will give you a broad base of high-level knowledge to keep up with the rapid advances in the

field of computer science. You will develop specialist skills in at least one area of:

- » Artificial intelligence
- » Cybersecurity
- » Distributed systems
- » Human-computer interaction
- » Spatial information science

The structure of this course is one year of coursework plus a one-year research project.

You'll complete an independent project in our chosen research area, supported by one of our academic experts. You'll leave the course with a major research project to feature in your CV.

First year

Second year

Core subject	Foundation selectives	Electives	Core subject
Research Methods	Choose at least two of: » Knowledge Technologies » Declarative Programming » Distributed Computing » AI Planning for Autonomy » Evaluating the User Experience » Foundations of Spatial Information	Choose up to five electives, focusing on areas such as: » Advanced Computer Science » Artificial Intelligence » Cybersecurity » Human-Computer Interaction » Programming Languages and Distributed Computing » Spatial Information	Computer Science Research Project

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/2020/courses/mc-cs

Graduate Diploma in Computer Science

At a glance:



Duration:
1 year



Intake: February (Sem 1),
July (Sem 2)



Designed for: Pathway to the Master of Computer Science

The Graduate Diploma in Computer Science provides students with any undergraduate degree and some programming/mathematics experience with the equivalent of a major in Computer Science.

The course will augment students' existing knowledge with considerable technical expertise in computer science, including exposure to a variety of programming paradigms, an understanding of the systematic processes underpinning the software development lifecycle, and an appreciation of advanced topics in computing.

Students will complete between four and six core subjects, with the electives making up a total of eight subjects.

Core subject	Electives
Choose at least two of: » Database Systems » Elements of Data Processing » Introduction to Programming And choose at least two of: » Internet Technologies » Algorithms and Complexity » Programming and Software Development	Choose up to four electives, focusing on areas such as: » Artificial intelligence » Machine learning » Graphics and interaction » Software modelling and design » IT project » Declarative programming » Models of computation » Distributed systems » Web information technologies

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/2020/courses/gd-cs

Graduate Certificate in Computer Science

At a glance:



Duration:
6 months



Intake: February (Sem 1),
July (Sem 2)



Designed for: Pathway to
the Master of Computer Science

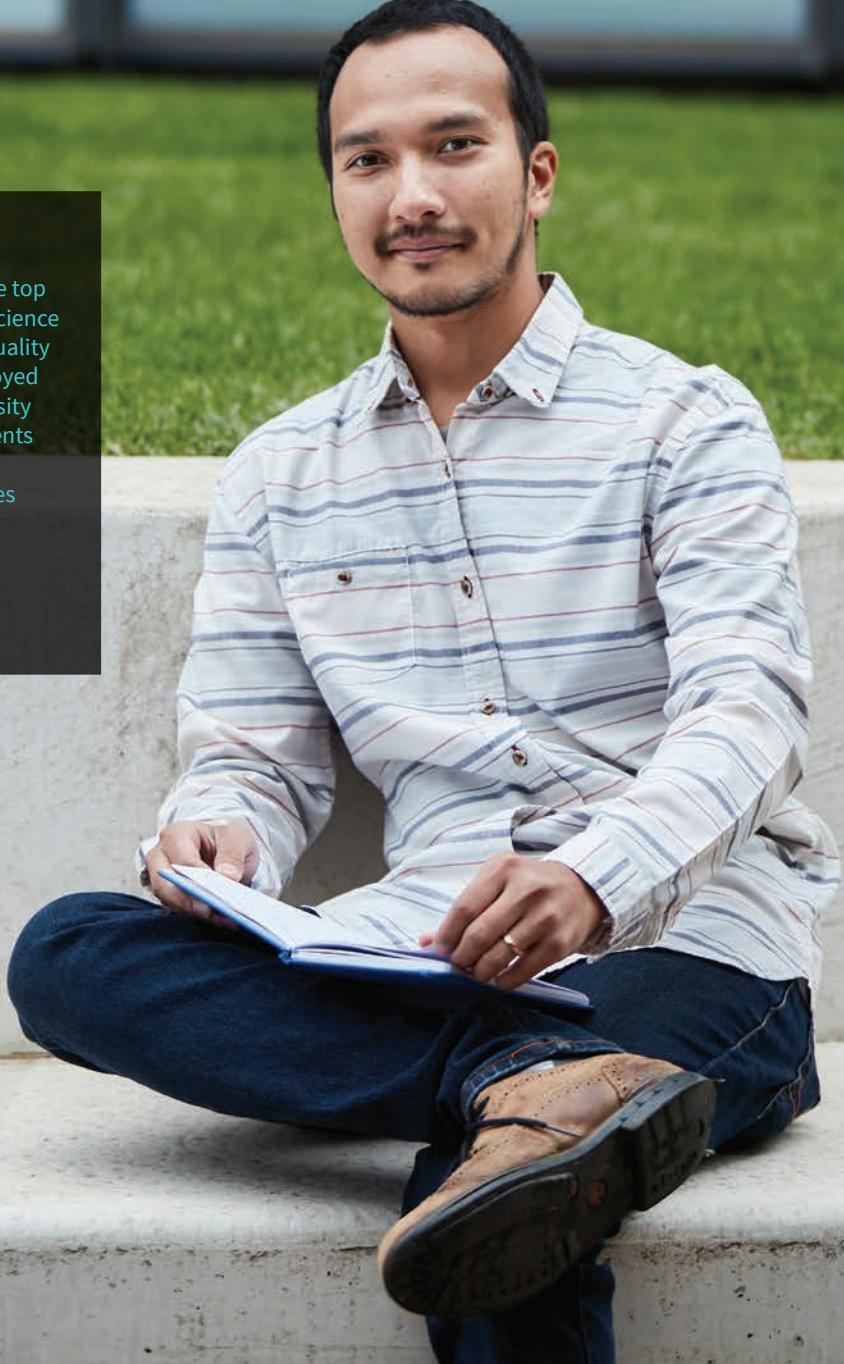
The Graduate Certificate in Computer Science provides students with any undergraduate degree and significant programming/mathematics experience with the equivalent of a major in Computer Science. It is effectively equivalent to the second half of the Graduate Diploma in Computer Science.

Students will complete between one and three core subjects, with the electives making up a total of four subjects.



"I chose the University of Melbourne because it is in the top 35 worldwide for computer science and is well-known for high-quality research. What I've most enjoyed about my studies is the diversity of people in my course: students and lecturers. I love seeing various ideas and perspectives from others."

Sonny Theo Tumbur
Master of Computer Science



MECHANICAL ENGINEERING, AEROSPACE AND MECHATRONICS

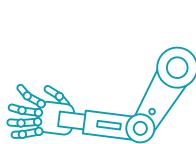
From aerospace to swarm robotics, use your skills in mechanical engineering and mechatronics to design the machines to improve efficiencies in the world around us, and the world beyond.

What is mechanical and mechatronics engineering?

Mechanical engineering focuses on turning energy into power and motion, spanning industries such as aeronautics, robotics and manufacturing.

Mechatronics drives the development of 'smart' computer-controlled products, such as robots, drones, automotive equipment and medical imaging systems.

Our world-leading mechanical engineering and mechatronics research:



Physical
human-robot
collaboration



Advanced and
accessible
prosthetics



Improving
the efficiency
of aircraft



3D-printing to
manufacture
new body
parts

Learn from world-leaders in fluid mechanics, biomechanics, robotics, thermodynamics and materials science.



"My degree is helping me develop a strong foundation and understanding of theoretical concepts in engineering, which will help me better develop a practical product or contribute to engineering projects in my future career. I have really enjoyed the practical projects like the Warman Design and Build Competition as a part of one of my Mechanical Engineering subjects."

Nur Najmi Rizqandri
Master of Engineering
(Mechanical)



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

At a glance:

 **Duration:**
2-3 years

 **Intake:**
February (Sem 1),
July (Sem 2)

 **Designed for:**
Becoming an accredited
mechanical engineer

 **Accredited by:**
Engineers Australia
and EUR-ACE

- » Participate in cross-disciplinary projects, including medicine, biology and earth sciences
- » Focus on the generation, conversion, design and use of energy and discover how to turn energy into power and motion
- » Examine the construction and operation of devices and systems

Master of Engineering (Mechanical)

If you have not completed a major in mechanical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Mechanical)**:

Year 0	Sem 1	Numerical Methods in Engineering	Engineering Mathematics	Foundations of Electrical Networks	Engineering Mechanics
	Sem 2	Mechanical Systems Design	Systems Modelling and Analysis	Thermodynamics and Fluid Mechanics	Mechanics and Materials

If you have completed a major in mechanical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Mechanical)**:

Year 1	Sem 1	Thermodynamics	Dynamics	Materials	Design for Manufacture
	Sem 2	Fluid Dynamics	Solid Mechanics	Control Systems	Critical Communication for Engineers / Creating Innovative Engineering
Year 2	Sem 1	Advanced elective*	Advanced elective*	Advanced elective*	Capstone Project
	Sem 2	Advanced elective*	Advanced elective*	Advanced elective*	

Master of Engineering (Mechanical with Business)

If you have not completed a major mechanical engineering in your undergraduate degree, study the 3 year Master of **Engineering (Mechanical with Business)**:

Year 0	Sem 1	Numerical Methods in Engineering	Engineering Mathematics	Foundations of Electrical Networks	Engineering Mechanics
	Sem 2	Mechanical Systems Design	Systems Modelling and Analysis	Thermodynamics and Fluid Mechanics	Mechanics and Materials

If you have completed a major in mechanical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Mechanical with Business)**:

Year 1	Sem 1	Dynamics	Materials	Design for Manufacture	World of Engineering Management
	Sem 2	Solid Mechanics	Control Systems	Engineering Contracts and procurement	Marketing Management for Engineers
Year 2	Sem 1	Engineering Capstone Project	Thermodynamics	Elective	Economic Analysis for Engineers
	Sem 2		Fluid Dynamics	Elective	Strategy Execution for Engineers

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

* Mechanical Engineering electives include subjects such as Advanced Motion Control, Advanced Fluid Dynamics, Economic Analysis for Engineers, Advanced Control Systems, Advanced Materials, Sensor Systems, and others.

 Core subject

 Business subject

 Elective

Master of Engineering (Mechanical with Aerospace)

At a glance:

 **Duration:**
2-3 years

 **Intake:**
February (Sem 1),
July (Sem 2)

 **Designed for:**
Becoming an accredited mechanical engineer specialising in aerospace

 **Accredited by:**
Engineers Australia*

» Focus on aerospace engineering, while also developing advanced skills and knowledge in mechanical engineering

» Learn from world-leaders in autonomous systems, fluid mechanics, thermodynamics and materials science

» Choose your career: be equipped for positions in the aerospace industry or apply your mechanical engineering skills across diverse industries

Master Of Engineering (Mechanical with Aerospace)

If you have not completed a major in mechanical engineering in your undergraduate degree, study the 3 year **Master of Engineering (Mechanical with Aerospace)**:

Year 0	Sem 1	Numerical Methods in Engineering	Engineering Mathematics	Foundations of Electrical Networks	Engineering Mechanics
	Sem 2	Mechanical Systems Design	Systems Modelling and Analysis	Thermodynamics and Fluid Mechanics	Analog and Digital Electronic Concepts

If you have completed a major in mechanical engineering in your undergraduate degree, study the 2 year **Master of Engineering (Mechanical with Aerospace)**:

Year 1	Sem 1	Thermodynamics	Dynamics	Materials	Design for Manufacture
	Sem 2	Fluid Dynamics	Solid Mechanics	Control Systems	Critical Communication for Engineers / Creating Innovative Engineering
Year 2	Sem 1	Capstone Project	Advanced Fluid Dynamics	Computational Fluid Dynamics	Aerospace Dynamics and Control
	Sem 2		Vibrations and Aeroelasticity	Aerospace Propulsion	Elective

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

*The Master of Engineering (Mechanical with Aerospace) has provisional accreditation until sufficient students have graduated.

 Core subject

 Elective



Connect with the Melbourne Space Program

Starting with a group of students with a vision to build a nanosatellite, the Melbourne Space Program (MSP) quickly evolved into a team of 100 volunteers who are dedicated to strengthening the Australian aerospace sector. Their mission: to put Australian students at the forefront of the space industry and bridge the gap between curriculum and career.



Our student opportunities

Internships

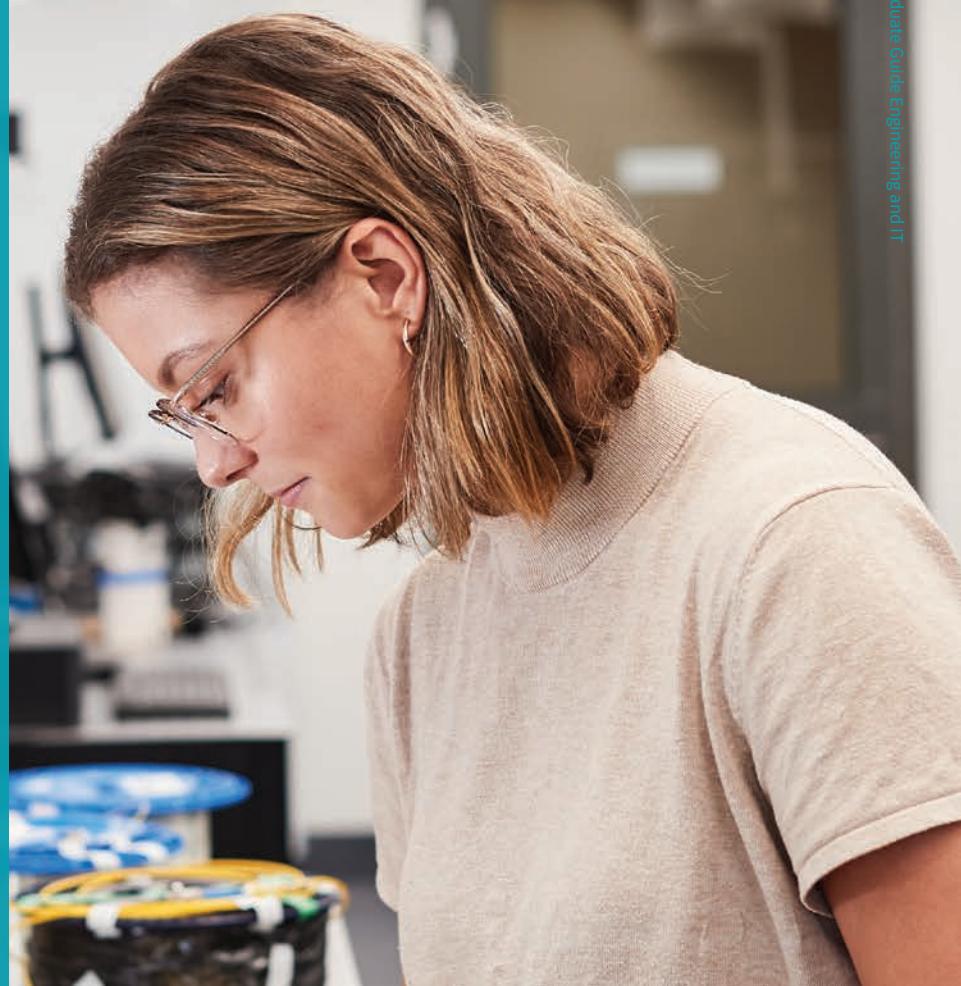


- » Infrastructure and construction
- » Aerostructures
- » Biotechnology
- » Manufacturing
- » Mining and resources
- » Water resources
- » Health

Student projects



- » Read, write and debug programs in high-level programming languages such as C, Matlab, Python as well as design and analyse using advanced simulations softwares such as, Autocad, Openfoam, and others
- » Access cutting edge laboratories and a heavy engineering workshop for materials testing, engine and turbine testing, wind tunnel investigations and metal forming processing



Where our graduates work

Industries



- » Aeronautics
- » Automotive
- » Biomechanics
- » Manufacturing
- » Minerals and Energy
- » Power Generation
- » Robotics
- » Transport

Companies

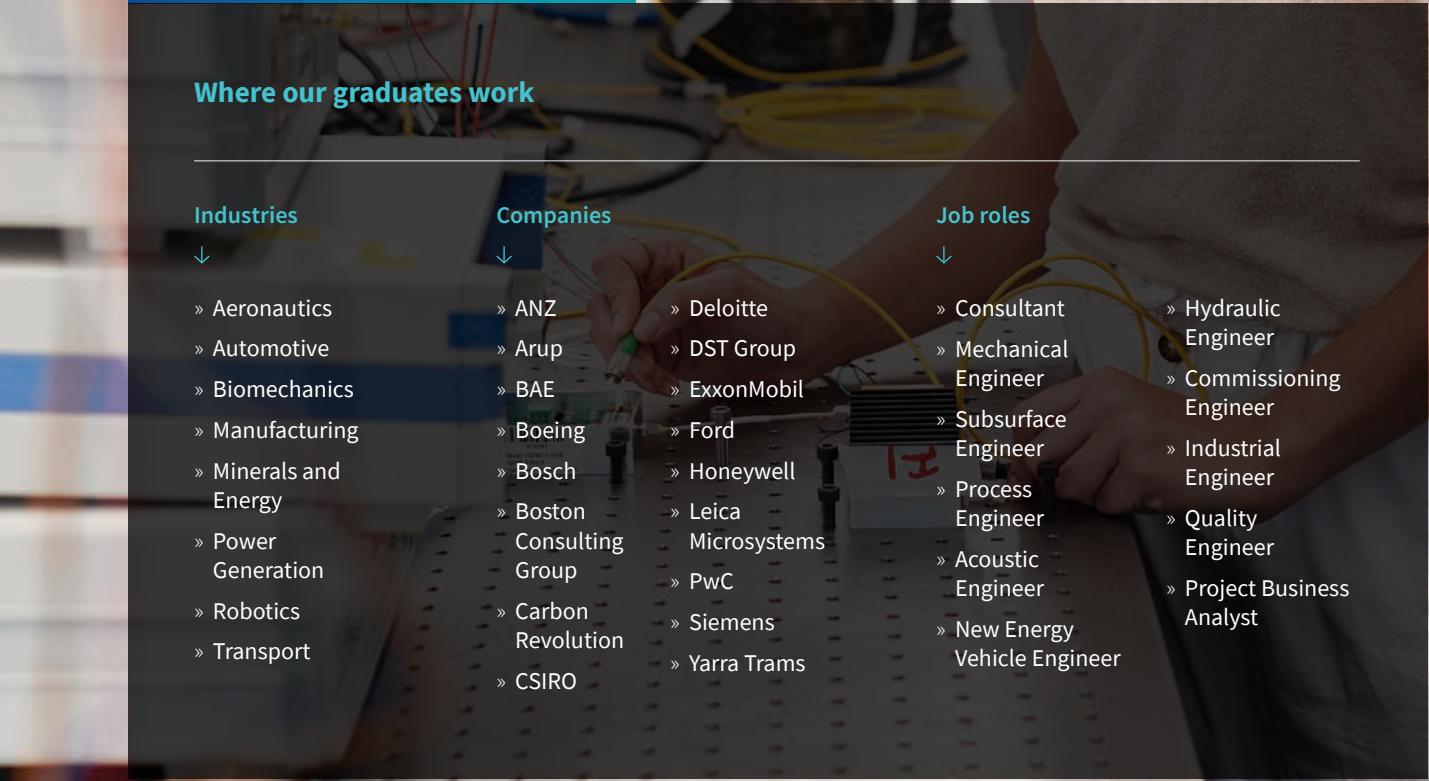


- » ANZ
- » Arup
- » BAE
- » Boeing
- » Bosch
- » Boston Consulting Group
- » Carbon Revolution
- » CSIRO
- » Deloitte
- » DST Group
- » ExxonMobil
- » Ford
- » Honeywell
- » Leica Microsystems
- » PwC
- » Siemens
- » Yarra Trams

Job roles



- » Consultant
- » Mechanical Engineer
- » Subsurface Engineer
- » Process Engineer
- » Acoustic Engineer
- » New Energy Vehicle Engineer
- » Hydraulic Engineer
- » Commissioning Engineer
- » Industrial Engineer
- » Quality Engineer
- » Project Business Analyst



Master of Engineering (Mechatronics)

At a glance:

 **Duration:**
2-3 years

 **Intake:**
February (Sem 1),
July (Sem 2)

 **Designed for:**
Becoming an accredited
mechatronics engineer

 **Accredited by:**
Engineers Australia
and EUR-ACE

» Become an accredited mechatronics engineer

» Blend mechanical, electrical and software engineering to develop automation and advanced manufacturing technologies

» Understand and exploit emerging technological developments, such as robotics, machine learning, autonomous systems and flexible manufacturing

Master of Engineering (Mechatronics)

If you have not completed a major in mechatronics engineering in your undergraduate degree, study the 3 year **Master of Engineering (Mechatronics)**:

Year 0	Sem 1	Engineering Computation	Engineering Mathematics	Analog and Digital Electronic Concepts	Engineering Mechanics
	Sem 2	Numerical Programming for Engineers	Systems Modelling and Analysis	Mechatronics Systems Design	Foundations of Electrical Networks

If you have completed a major in mechatronics engineering in your undergraduate degree, study the 2 year **Master of Engineering (Mechatronics)**:

 Core subject  Elective

Year 1	Sem 1	Control Systems	Dynamics	Creating Innovative Engineering / Creating Innovative Professionals	Introduction to Machine Learning / Internet Technologies
	Sem 2	Advanced Control Systems	Advanced Dynamics	Embedded System Design	Programming and Software Development
Year 2	Sem 1	Advanced Motion Control / Robotic Systems	Mechatronics Elective	Mechatronics Elective	Mechatronics Capstone Project
	Sem 2	Sensor System	Mechatronics Elective	Mechatronics Elective	

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

 Core subject  Elective





“During the first year of my Masters and the duration of my Bachelors, I have really appreciated the quality of teaching I received. My highlights would include the more practical projects I have been involved in, such as the prosthetic hand project and developing a game.

Through the Summer Internship Subject, I was encouraged to find an internship that I found incredibly valuable to my development and learning.”

John Laidlaw

Master of Engineering (Mechatronics)
Bachelor of Science

Our student opportunities

Internships

- ↓
- » Electronics
- » Automotive
- » Biotechnology
- » Manufacturing

Student experience

- ↓
- » Read, write and debug programs in high-level programming languages such as C
- » Access world-class facilities including wind tunnels, alternative fuel engines, rehabilitation robots, UAV platforms and large-scale water management systems

Where our graduates work

Industries

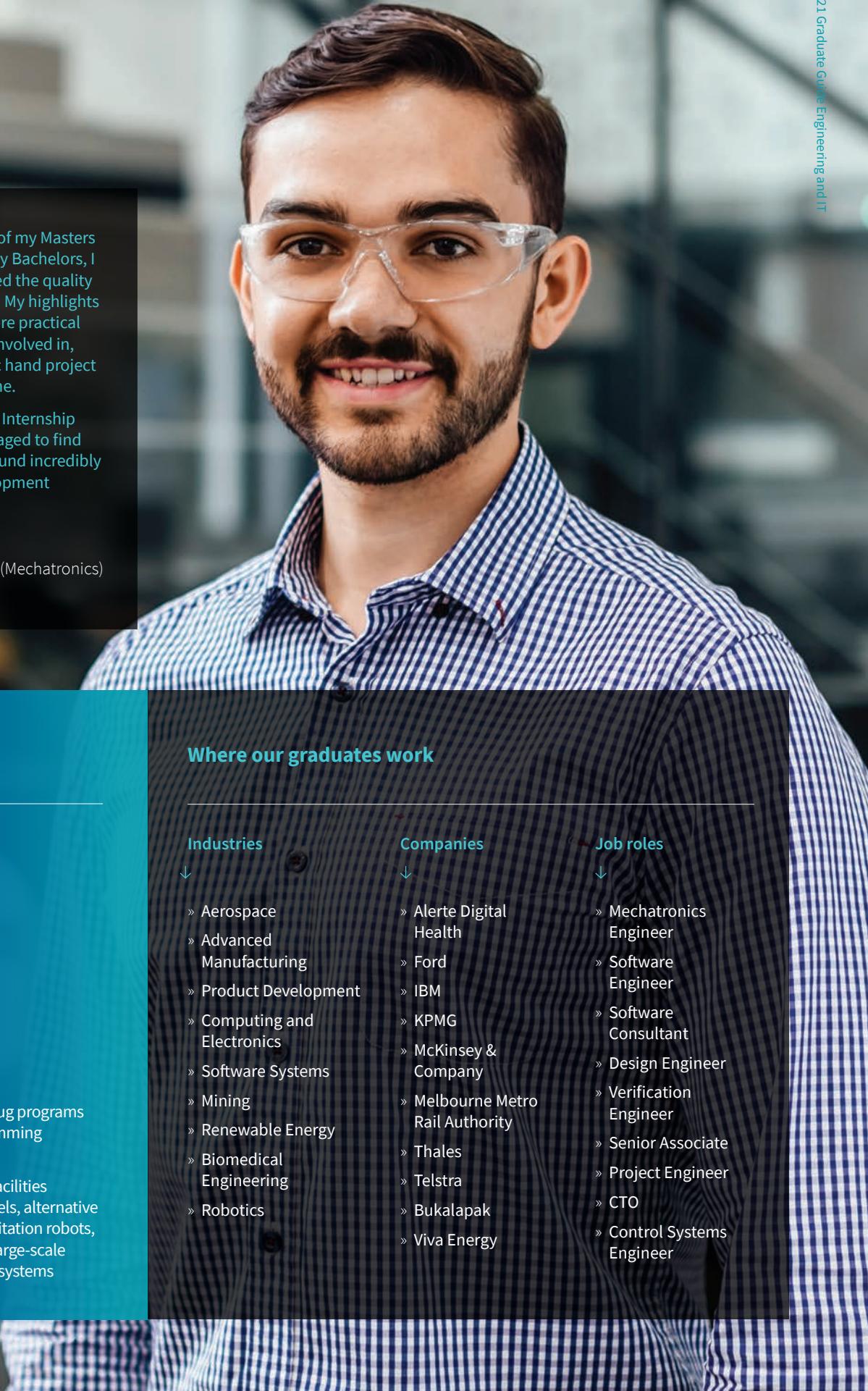
- ↓
- » Aerospace
- » Advanced Manufacturing
- » Product Development
- » Computing and Electronics
- » Software Systems
- » Mining
- » Renewable Energy
- » Biomedical Engineering
- » Robotics

Companies

- ↓
- » Alerte Digital Health
- » Ford
- » IBM
- » KPMG
- » McKinsey & Company
- » Melbourne Metro Rail Authority
- » Thales
- » Telstra
- » Bukalapak
- » Viva Energy

Job roles

- ↓
- » Mechatronics Engineer
- » Software Engineer
- » Software Consultant
- » Design Engineer
- » Verification Engineer
- » Senior Associate
- » Project Engineer
- » CTO
- » Control Systems Engineer



SPATIAL ENGINEERING AND INFORMATION TECHNOLOGY

In a world where everything is geolocated, spatial information is at the forefront of the Internet of Things, autonomous vehicles and how our cities work.

What is spatial information?

Spatial information, or geomatics, answers the fundamental questions of 'where' and 'when' in public administration, planning, construction, infrastructure management, navigation, safety and resilience, and the sharing economy.

Our world-leading spatial engineering research:



Surveying and mapping for disaster management



How ridesharing is going social



Taking a city's pulse: touch-ons, transactions and tweets



Indoor wayfinding and building evacuation

Spatial engineering or spatial information technology?

If you have a science or maths background, and want to become an accredited spatial engineer, then the Master of Engineering (Spatial) is for you.

Or, if you want to apply your skills on data analytics, smart cities, and information services, study spatial information through the Master of Information Technology.

Master of Engineering (Spatial)

At a glance:

 **Duration:** 2-3 years

 **Intake:** February (Sem 1), July (Sem 2)

 **Designed for:** Becoming an accredited spatial engineer

 **Accredited by:** Engineers Australia, EUR-ACE, Surveyors Registration Board Victoria, Royal Institution of Chartered Surveyors

- » Focus on the science and technology of measurement, mapping and visualisation.
- » Develop skills in geographic information systems (GIS), 3D computer visualisations, surveying and satellite and photographic image processing.

Master of Engineering (Spatial)

If you have not completed a major in spatial engineering in your undergraduate degree, study the 3 year **Master of Engineering (Spatial)**:

	Sem 1	Engineering Computation	Engineering Risk Analysis	Application of GIS	Imagining the Environment
Year 0	Sem 2	Surveying and Mapping	Integrated Spatial Systems	Land Administration Systems	Approved elective

If you have completed a major in spatial engineering in your undergraduate degree, study the 2 year **Master of Engineering (Spatial)**:

Year 1	Sem 1	Foundations of Spatial Information	Approved elective	Selective: Critical Communication for Engineers / Creating Innovative Engineering	Advanced Imaging
	Sem 2	Approved elective	Satellite Positioning Systems	Spatial Analysis	Mathematics of Spatial Information
Year 2	Sem 1	Advanced Surveying and Mapping	Spatial Databases	Approved elective	EMI Capstone
	Sem 2	Selective: Management Competencies / The World of Engineering Management	Engineering Project Implementation	Spatial Data Infrastructure	

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-eng

 Core subject

 Elective

Where our graduates work

Industries	Companies	Job roles
↓	↓	↓
» Aeronautics	» Arup	» Consultant
» Agriculture	» BR Smith & Associates	» Surveyor
» Architecture	» Office of Surveyor-General	» Geospatial Analyst
» Emergency Management	» Department of Economics Development, Jobs, Transport and Resources	» Technical Consultant
» Health	» Reeds Consulting	» Web Developer
» Land and Resources	» Synchronoss Technologies	» Analyst
» Mining	» Geoscience Australia	» Project Surveyor
» Property	» Jacobs	» Verson
» Transport		
» Urban Planning		

Our student opportunities

Internships

- ↓
- » Transport
- » Infrastructure
- » Surveying

Student Project

- ↓
- » Take part in practical outdoor assignments to produce a detailed contour plan of an area
- » Visit the regional Dookie campus in a four-day field work program

Master of Information Technology (Specialisation: Spatial)

At a glance:



Duration:
1-2 years



Intake:
February (Sem 1),
July (Sem 2)



Designed for:
Becoming an accredited
IT professional



Accredited by: Australian
Computer Society, Royal
Institution of Chartered
Surveyors

- » Focus on cutting-edge information and communication technology

For more information about the Master of Information Technology (Spatial), see page 44.

Master of Information Technology (Spatial)

Year 1	Sem 1	Programming and Software Development	Algorithms and Complexity	Internet Technologies	Database Systems & Information Modelling
	Sem 2	Foundations of Spatial Information	Information Visualisation	Spatial Elective	Spatial Elective
Year 2	Sem 1	Spatial Databases	Spatial Information Programming	Spatial Elective	Software Processes and Management
	Sem 2	Spatial Data Infrastructure	Spatial Analysis	Spatial IT Project	

Sample plans are an indicative guide only and subjects may change. See handbook.unimelb.edu.au/courses/mc-it

Core subject

Elective





"I recently completed an internship at Aurecon. The internship definitely has made me career ready. Having a new insight into the latest technologies used, I am able to tailor my learning so that I have the appropriate foundations to keep up to date with industry requirements."

**Lavannyemesha
Sivagurunathan**

Master of Engineering (Spatial)
Bachelor of Science



ENGINEERING AND IT RESEARCH DEGREES

Join an environment of cross-disciplinary research excellence and work alongside researchers who are creating technological solutions to global challenges.

As a Melbourne graduate research student, you'll carry out an independent and sustained engineering or IT research project under supervision from one of our world-class researchers.

Your research options

Master of Philosophy (MPhil)

Duration: Typically 1.5 years full-time

Doctor of Philosophy (PhD)

Duration: Typically at least 3 years full-time

How to apply

Applications can be submitted at any time. You must secure an academic supervisor prior to making an application and supply documented evidence.

Finding a project/supervisor

To search for available PhD projects visit

study.unimelb.edu.au/find/courses/graduate/doctor-ofphilosophyengineering

To search for a supervisor visit

findanexpert.unimelb.edu.au

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 fourth year Bachelor or Masters level
- » A weighted average equivalent to the University of Melbourne's 80%.

Scholarships

You will be automatically considered for a scholarship at the time of application. Scholarship benefits range from full fee remission to general allowances, including relocation grants, Conference Travel Scholarships, Overseas Student Health Cover (OSHC) and sick leave.

Scholarships include:

Graduate Research Scholarships:

100% fee remission and stipend available to high-achieving domestic and international students

Ingenium Scholarships: available to high achieving domestic students

What is a competitive score?

80% WAM:

- » Competitive for entry, but does not guarantee admission.
- » A competitive score for local applicants from Go8 institutions for the Research Training Program (RTP)

85% WAM:

- » A competitive score for local applicants from non Go8 institutions for the Research Training Program (RTP)
- » A competitive score for international applicants for a Melbourne International Research Scholarship and Fee Remission Scholarship

Our institutes and partnerships



- » Centre for Neural Engineering
- » Centre for Disaster Management and Public Safety
- » Graeme Clark Institute for Biomedical Engineering
- » Melbourne Networked Society Institute
- » IBM Research
- » Peter Cook Centre for Carbon Capture and Storage
- » Dairy Innovation Australia Ltd
- » Microsoft
- » Rio Tinto
- » Ford

Treating real-world injuries with virtual reality



Although the Computer Assisted Rehabilitation Environment (AIMES) resembles an immersive video game, this unique technology is changing how we approach injury prevention and treatment.

Housed in Melbourne School of Engineering's MedTech Linkway, AIMES allows researchers to understand how patients are responding to rehabilitation in real time.

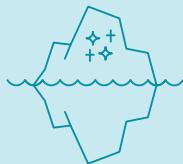
Using this curved virtual reality screen and ground-level mobile platform, researchers see how joints and muscles move. The screen projects a 3D musculoskeletal model of patients' bodies, with the muscles

being used lighting up as patients move. Researchers can also collect information about muscle and brain activity through electromyography (EMG) and electroencephalography (EEG), assisting the rehabilitation of stroke sufferers.

With such diverse capabilities, AIMES supports cross-disciplinary research and helps researchers in engineering, medicine and science collaborate to solve major issues surrounding ageing, rehabilitation, human performance, mental health, computer science and even animation.

Research disciplines

Our research is interdisciplinary and collaborative, connecting diverse study areas and working closely with industry. As a Melbourne graduate research student, you'll have the opportunity to make valuable contributions to areas such as water resource management, clean energy, disaster management, climate change, cancer treatment, epilepsy suppression, food processing, artificial intelligence, personalised medicine and smart grids.

Discipline	Research themes	Our graduate research students work on
Biomedical engineering 	» Biomaterials and tissue engineering » Biomechanics and mechanobiology » Bionics » Biomedical imaging and neuroimaging » Systems and synthetic biology	» Human vision during migraine, ageing and disease » Mapping the human schizophrenia connectome » How cardiac cells grow » Neural plasticity for brain-machine interfaces
Chemical engineering 	» Materials development » Separations technology » Surface chemistry and rheology » Bioprocessing	» Australian dairy manufacturing » Biodegradable and drug-eluting coronary artery stents » Self-healing polymers » Tissue engineering of soft tissues » Keeping Antarctica clean
Computing and information systems 	» Data and knowledge » Platforms and systems » People and organisations	» Adversarial machine learning » Apps for addiction recovery » Efficient cloud computing » Dynamics and control of infectious diseases » Electronic voting in elections » eSports » Information security management
Electrical and electronics engineering 	» Communication and networks » Control and signal processing » Photonic and electronic systems » Power and energy systems	» Cybersecurity » Deep brain stimulation for Parkinson's disease therapy » Epileptic seizure warning methods » Computer-aided diagnosis of melanoma » Sustaining internet growth » Wireless sensor networks
Infrastructure engineering 	» Civil engineering » Geomatics » Environmental hydrology and water resources	» Bio-inspired lightweight composite system for blast and impact protection » Recycled glass in lightweight concrete » Self-healing maps » Indoor air quality » Prefabricated building systems » Reassessing earthquake design
Mechanical engineering 	» Autonomous systems » Biomechanics » Fluid dynamics » Thermodynamics	» Heart cell biomechanics » Air-sea interaction » Assistive and rehabilitation robotics » Breast cancer risk assessment » Low emission transport » Robot-assisted minimally invasive surgery » Dextrous robotic hand neuroprostheses

To explore more research projects, view the Department website for your discipline of interest.

FEES AND SCHOLARSHIPS

Commonwealth Supported Places (CSPs)

Limited CSPs are available to domestic students. Students pay part of the tuition fee (the student contribution) and the Australian Government pays the remaining contribution. Fees are based on the subjects in which you enrol, rather than the overall course. Eligible students can apply for a HECS-HELP loan to defer upfront payment of their student contribution. studyassist.gov.au

Guaranteed CSPs for Melbourne graduates

If you have completed a Bachelors degree at the University of Melbourne with a weighted average mark of 65%, you are guaranteed a CSP in professional entry programs (provided you meet the program entry requirements), see page 6-11.

Australian Fee Places & FEE-HELP

If you are a domestic student who is not enrolled in a CSP, you may be eligible to defer payment of all or part of your tuition fees via the FEE-HELP loan scheme. studyassist.gov.au

Transferring from an Australian fee place to a CSP

After completing 100 points of study (equivalent to 1 year full-time), high achieving students may be eligible to transfer to a CSP. Please note there are limited numbers of transfers available per semester.

Graduate Access Melbourne

Domestic students may be eligible to apply for Graduate Access Melbourne if you're a member of a specified group that is underrepresented in higher education (such as women in engineering and IT) or if personal circumstances have had a sustained, adverse effect on your academic achievement.

gradaccess.unimelb.edu.au

Financial Aid

The University's Student Financial Aid service can provide enrolled students with assistance and advice, about student loans and bursaries, student income support and cost of living guidance. services.unimelb.edu.au/finaid

Indicative 2021 annual coursework fees¹



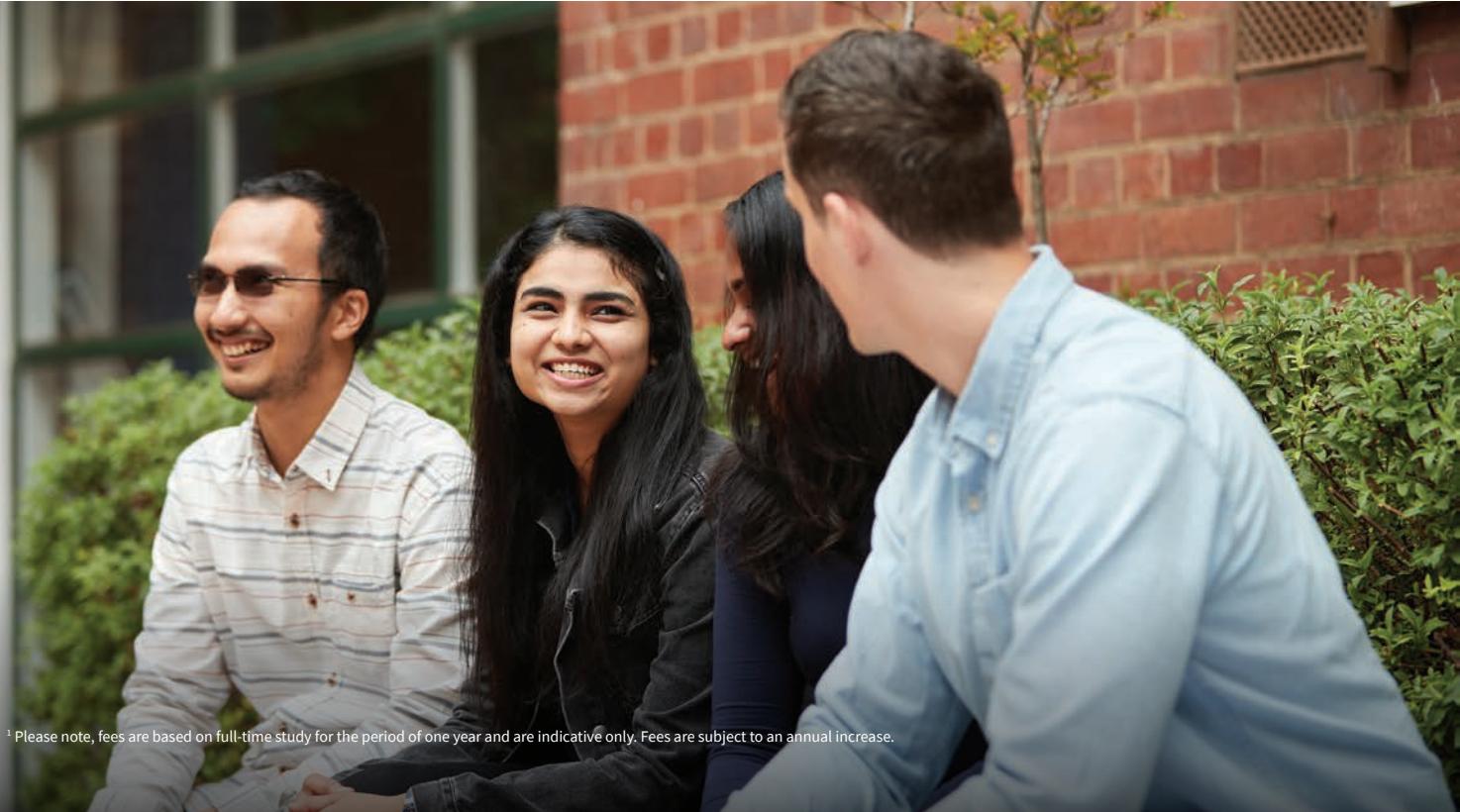
Graduate Certificate in Port Engineering

- » Domestic full fee: \$17,872 per annum
- » International fee: \$22,368 (AUD) per annum

All other graduate coursework programs

- » Domestic full fee: \$35,744 per annum. CSPs available in all professional entry programs. See page 6-11.
- » International: \$44,736 (AUD) per annum

For more information about fees, scholarships and more, visit: study.unimelb.edu.au/how-to-apply/fees



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.

Engineering and IT Graduate Coursework Scholarships

Scholarship	Eligible Courses	Amount awarded	Who is it for?
Melbourne School of Engineering Foundation Scholarships	» Master of Engineering » Master of Information Technology » Master of Information Systems » Master of Energy Systems	\$5,000 – \$10,000 per annum, 12-15 awarded per year	Domestic and International students
Melbourne School of Engineering Scholarships	All engineering and IT graduate coursework programs	\$5,000 – \$20,000 per annum, up to 100 awarded per year	Domestic and International students
Melbourne Graduate Scholarship	All engineering and IT graduate coursework programs	50% fee remission, 2 awarded per year	International students only
JH Mirams Memorial Scholarships	Specialised masters programs: » Master of Energy Systems » Master of Engineering Management » Master of Engineering Structures » Master of Environmental Engineering	\$5,000 – \$10,000 per annum	Domestic and International students

Scholarships for engineering and IT students

Melbourne School of Engineering scholarships are awarded competitively based on academic merit. You will be considered for relevant scholarships at the time of course offer and you do not need to make a separate application.

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. 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.

If you want to take part in conferences, programs or other extracurricular activities to broaden your experience, you could apply for funding via a Student Enrichment Grant.



HOW TO APPLY

Application checklist

01.

Check the entry requirements and make sure you're eligible (See Quick Reference Guide on pages 4-9 for a complete list of entry requirements or go to:
study.unimelb.edu.au

02.

Ensure you meet the University's English language requirements (see page 67)

03.

Gather the supporting documentation listed below

04.

Complete the online application form: study.unimelb.edu.au

If you haven't previously completed a degree at the University of Melbourne, you'll need to provide:

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 and Master of Information Technology applicants only)*

Additional documentation

Evidence of any relevant work experience if required, such as: a current curriculum vitae (CV) and reference letters from your employer(s) on company letterhead.

Application closing dates

Semester 1: (February)	Semester 2: (July)
All Professional Masters applicants: 30 November	All Professional Masters applicants: 30 April
Includes Master of Engineering, Master of Information Systems, Master of Computer Science and Master of Information Technology	Includes Master of Engineering, Master of Information Systems, Master of Computer Science and Master of Information Technology
International Specialised Masters applicants: 30 December ²	International Specialised Masters applicants: 30 April ¹
Domestic Specialised Masters applicants: 30 January ²	Domestic Specialised Masters applicants: 30 May ¹
Semester 1: Graduate Certificate in Port Engineering: 30 January	Semester 2: Graduate Certificate in Port Engineering: 30 April

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 1.

² Specialised masters courses include the Master of Engineering Structures, Master of Environmental Engineering, Master of Engineering Management and Master of Energy Systems.

*Applicants who have completed a Washington Accord accredited engineering degree and are applying for the same engineering discipline (excluding Chemical, Biomedical and Materials) are not required to submit a syllabus/subject description.



English language requirements

All students studying at the University of Melbourne must satisfy the University of Melbourne English language entry requirements. You can do this in a number of ways, depending on your circumstances. Applicants with a non-English speaking background can complete one of the English tests listed below:

Required scores must be achieved in one sitting within 24 months before your application.

For applicants from an English-speaking background, refer to the website for more details on the specific requirements:

<https://study.unimelb.edu.au/how-to-apply/english-language-requirements>

Application closing dates	IELTS (academic English only)	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)	79+ Writing 21; Speaking 18; Reading 13; Listening 13	58+ No communicative skill below 50	176+ No communicative skill below 169
Alternative English language requirements	6.0 (no band less than 5.5)	60 + Writing 18; Speaking 16; Reading 8; Listening 7	50 No communicative skill below 42	

If you meet the alternative English language requirements, you can complete the University of Melbourne English Language Bridging Program (UMELBP) and be eligible for entry: hawthornenglish.edu.au/english-language-courses/umelbp



eng.unimelb.edu.au

Contact us

Melbourne School of Engineering
The University of Melbourne
Victoria 3010 Australia

Graduate Enquiries

Within Australia: 13 6352
Outside Australia: +61 3 9035 5511

Connect with us

- ✉ 13MELB@unimelb.edu.au
- 🐦 twitter.com/engunimelb
- ƒ facebook.com/engunimelb
- instagram.com/engunimelb

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