Discover Engineering and IT 2024

Graduate Guide

THE UNIVERSITY OF MELBOURNE

Contents

The Melbourne Advantage

No. 1 in Australia
No. 14 in the world

QS World University Rankings 2024

No. 8 in the world
for graduate employability

QS Graduate Employability Rankings 2022

Be internationally recognised

Maximise your career opportunities around the world with globally recognised accreditation from Engineers Australia, Washington Accord (USA) and EUR-ACE® (Europe).

Be inspired by leading researchers

Learn from researchers who are globally recognised in their field. Our academics are working on ground-breaking innovations to solve some of societies biggest challenges, from developing epileptic seizure prediction devices to chemical blankets to protect coral reefs.

Connect with industry

Gain real-world experience through our industry-connected curriculum. Take part in internships, complete industry projects, undertake an innovation challenge with an industry mentor, and showcase your skills in our Endeavour Exhibition.

Melbourne Connect

Melbourne Connect is a purpose-built innovation precinct situated in the heart of the Melbourne Biomedical Precinct. It serves as a dynamic hub for digital talent, where companies of all sizes, graduates with specialised skills, emerging researchers, and visionary academics can come together.

Functioning as a thriving digital innovation ecosystem, Melbourne Connect acts as both a physical space and a programmatic convergence point for various organisations and interdisciplinary institutions. Their shared goal is to harness research and emerging technologies to disrupt and revolutionise our society.

The University of Melbourne acknowledges the Traditional Owners of the unceded land on which we work, learn and live: the Wurundjeri Woi Wurrung and Bunurong peoples (Burnley, Fishermans Bend, Parkville, Southbank and Werribee campuses), the Yorta Yorta Nation (Dookie and Shepparton campuses), and the Dja Dja Wurrung people (Creswick campus).

Quick reference guide

The Faculty of Engineering and Information Technology 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. Flexible study options are available, with most courses offering full-time or part-time study loads and Semester 1 (February) and Semester 2 (July) entry.

Professional entry programs

Professional entry programs are for those seeking a professional qualification in engineering or information technology and are typically taken after completing undergraduate studies. This is how you become a qualified engineer.

Advanced engineering programs

Specialised programs are available for qualified engineers and information technology professionals who are seeking to upskill and gain specialised experience. These programs are suitable for those looking for professional development in their field or preparing for a career change.

Research degrees

Research degrees or research pathway degrees provide a unique opportunity to complete research that helps further our knowledge and understanding of the engineering and information technology industries.

Course	Minimum entry requirements	Duration	Course type
Biomedical Engineering			
Master of Biomedical Engineering Optional specialisations: • Business	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects, specifically Linear Algebra and Calculus 2 • Equivalent of 2 first-year science subjects (either 2 biology or 2 chemistry) OR 1 second-year engineering mathematics subject (equivalent to MAST20029 Engineering Mathematics) **Advanced standing/credit** Up to one year of credit will be awarded to students with a Biomedical Engineering Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • EUR-ACE® • Engineers Australia
Chemical Engineering			
Master of Chemical Engineering Optional specialisations: • Business • Materials and Minerals • Sustainability and the Environment	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects, specifically 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 Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • EUR-ACE® • Engineers Australia • IChemE
Civil and Structural Engineering			
Master of Civil Engineering Optional specialisations: • Business • Energy • Structural • Transport • Geotechnical • Water Resources • Project Management	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects, specifically Linear Algebra and Calculus 2 • Equivalent of 2 first-year science subjects (2 physics, 2 biology, 2 chemistry or 2 computer science) **Advanced standing/credit** Up to one year of credit will be awarded to students with a Civil Engineering Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • EUR-ACE®4 • Engineers Australia
Master of Engineering Structures	65% weighted average mark 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

Course	Minimum entry requirements	Duration	Course type
Master of Architectural Engineering	**Engineering undergraduate degree:** • 65% weighted average mark • Design folio • Equivalent of one architectural history subject • Personal statement of 500 words outlining relevant prior study, work experience and motivation to undertake the program **OR** **Architecture undergraduate degree:** • 65% weighted average mark • Design folio • Equivalent of 2 first-year mathematics subjects, specifically Linear Algebra and Calculus 2 and two science subjects • Equivalent of 2 first-year science subjects (2 physics, 2 biology, 2 chemistry or 2 computer science) • 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*
Digital Infrastructure Engineering			
Master of Digital Infrastructure Engineering Optional specialisations: • Artificial Intelligence • Business • Communication Infrastructure • Construction • Cultural Heritage • Energy • Industry • Information Systems • Information Technology • Land • Mobility • Smart Cities • Sustainable Cities • Water	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects (any) • Equivalent of 2 first-year science subjects (physics, geography, chemistry, biology or computer science)	2-3 years full-time	Professional entry Accreditation: • Surveyors Registration Board, Victoria
Graduate Certificate in Digital Engineering (Infrastructure)	**Undergraduate degree in engineering, construction, architecture, or a related field of engineering, with:** • At least 50 points of tertiary level science or mathematics, or • At least 50 points of tertiary level science or mathematics, and at least two years documented, relevant work experience since graduation • 65% weighted average mark	1 year part-time	Professional entry
Electrical and Electronic Engineering			
Master of Electrical Engineering Optional specialisations: • Autonomous Systems • Business • Communications and Networks • Electronics and Photonics • Low-Carbon Power Systems	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects, specifically 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 an Electrical Engineering Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • EUR-ACE® • Engineers Australia
Energy			
Master of Energy Systems	**Undergraduate degree in a relevant discipline, such as commerce, science or engineering, and:** • 70% weighted average mark • Equivalent of one subject in mathematics, statistics or other quantitative subject • Two years of continuous, documented work experience in a relevant field if you have a weighted average mark of at least 65%	1.5 years full-time	Specialised masters
Engineering Management			
Master of Engineering Management	• Four-year undergraduate degree in engineering or relevant discipline • 65%+ weighted average mark **OR** • A three-year undergraduate degree in a relevant discipline with a 65% weighted average mark AND • At least 2 years of full-time documented, relevant work experience since graduation	1 year full-time	Specialised masters

Course	Minimum entry requirements	Duration	Course type
Environmental Engineering			
Master of Environmental Engineering Optional specialisations: • Earth Observation • Energy Systems • Water Systems	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects, specifically Linear Algebra and Calculus 2 • Equivalent of 2 first-year science subjects (2 biology, 2 chemistry, 2 physics, 2 geosciences or 2 geography) **Advanced standing/credit** Up to one year of credit will be awarded to students with an Environmental Engineering Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • EUR-ACE® • Engineers Australia
Master of Environmental Systems Engineering	• Four-year undergraduate engineering degree • 65% weighted average mark OR • Three-year undergraduate degree in a relevant discipline • 65% weighted average mark • At least two years of full-time, documented and relevant work experience	1 year full-time	Specialised masters
Industrial Engineering			
Master of Industrial Engineering	**Undergraduate degree with:** • Three-year undergraduate degree from the University of Melbourne in any engineering systems major • 65% weighted average mark OR • Four year Bachelor of Engineering degree • 65% weighted average mark	2 years full-time	Professional entry Accreditation: • EUR-ACE® • Engineers Australia
Mechanical and Mechatronics Engineering			
Master of Mechanical Engineering Optional specialisation: • Aerospace • Business • Manufacturing • Materials	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects, specifically 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 Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • EUR-ACE® • Engineers Australia
Master of Mechatronics Engineering Optional specialisation: • Manufacturing	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects, specifically 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 Mechatronics Engineering Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • EUR-ACE® • Engineers Australia
Information Technology and Software Engineering			
Master of Software Engineering Optional specialisation: • Artificial Intelligence • Business • Cyber Security • Distributed Computing • Human-Computer Interaction	**Undergraduate degree with:** • 65% weighted average mark • Equivalent of 2 first-year mathematics subjects (any) • Equivalent of 2 first-year computing, programming or computer science subjects **Advanced standing/credit** Up to one year of credit will be awarded to students with a Computing and Software Systems major in their undergraduate degree	2-3 years full-time	Professional entry Accreditation: • Euro-Inf® • Australian Computer Society • Engineers Australia
Master of Information Systems Optional specialisations: • Professional • Research	Depending on your work experience and undergraduate study, you may be eligible for advanced standing: **200 point (2 years full-time) program** • Undergraduate degree in any discipline • 65% weighted average mark **150 point (1.5 years full-time) program** • Undergraduate degree in any discipline • 65% weighted average mark • One year of documented, relevant work experience **100 point (1 year full-time) program** • Undergraduate degree in information systems • 65% weighted average mark • Two years of documented, relevant work experience	1-2 years full-time	Professional entry Accreditation: Australian Computer Society

Course	Minimum entry requirements	Duration	Course type
Master of Information Technology Optional specialisations: • Artificial Intelligence • Computing • Cyber Security • Digital Innovation • Distributed Computing • Human-Computer Interaction	Depending on your work experience and undergraduate study, you may be eligible for advanced standing: **200 point (2 years full-time) program** • Undergraduate degree in any discipline • 65% weighted average mark • One technical computer programming subject **150 point (1.5 years full-time) program** • Three-year undergraduate degree with a major in computer science, information technology, software engineering or related discipline, for example: – Computing and Software Systems major in the Bachelor of Science – Computing and Software Systems or User Experience Design major in the Bachelor of Design • 65% weighted average mark **100 point (1 year full-time) program** • Four-year undergraduate degree with a major in computer science, information technology, software engineering or related discipline • 65% weighted average mark and either: – 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
Master of Data Science	**Undergraduate degree in computer science, data science** • 65% weighted average mark • 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
Graduate Diploma in Data Science	**Undergraduate degree in any discipline and the following subjects (or their equivalent)** • Calculus 2 • Linear Algebra	1 year full-time	Professional entry
Master of Science (Bioinformatics)	• Undergraduate degree with a major in computer science • 65% weighted average mark 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 or the Bachelor of Design • 75% weighted average mark • At least 25 points of university level mathematics or statistics subjects	2 years full-time	Research pathway
Graduate Diploma in 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 mark	1 year full-time	Professional entry
Graduate Certificate in 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 mark	6 months full-time	Professional entry
Graduate research			
Master of Philosophy (MPhil) **and** **Doctor of Philosophy (PhD)**	• 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 mark in the equivalent of penultimate and final year subjects OR • 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 mark OR • Qualification or professional experience considered to be equivalent	**MPhil:** 1.5 -2 years full-time **PhD:** 3-4 years full-time	Research degree

Build a career of the future

Scan to learn more

Join the next generation of innovators, working towards a more productive and sustainable tomorrow. During your degree, you'll have access to internships 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 information technology.

Gain real-world experience

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 Science, Technology, Engineering and Mathematics (STEM) mentor.

Internships

The internship subject is available to domestic and international students in selected Master of Engineering, Master of Information Technology and Master of Information Systems programs.

- Undertake professional work experience for 10-16 weeks (approximately 320-350 hours).
- Gain credit towards your degree.
- Take part in workshops to improve your resume, develop your presentation skills and enhance your employability for the future.
- Explore international and domestic internship opportunities related to your discipline and career goals.
- Develop a competitive edge for the graduate job market and make yourself stand out amongst other candidates.

Industry connected curriculum

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

- Available in the Master of Engineering suite, Master of Information Technology and Master of Information Systems.
- Undertake your project over the course of a semester, full-year or summer break.
- Develop a collaborative relationship with industry practitioners.
- 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.

Endeavour Exhibition

The Endeavour Exhibition showcases our final-year engineering and information technology masters students' projects. Students work in collaboration with government and industry partners to solve real-world challenges and this exhibition is a unique opportunity to demonstrate their engineering and information technology capabilities. **Find out more on page 44.**

Telstra Creator Space

You'll have access to a fabrication lab located in the innovation precinct, Melbourne Connect. It's a space where technology and creativity combine to form innovative solutions and it's open to all staff and students. **Find out more on page 45.**

Engineering and Information Technology Experience Series

The Experience Series brings you events and initiatives that connect you with industry, enhance your professional and technical skills and bring you together with other students. Join us for our industry, professional and technical workshops, and wellbeing series.

Clubs and societies

Our student clubs bring together people who are passionate about engineering and information technology 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.

Some of our clubs include:

- Aerospace and Rocket Engineering Society (ARES)
- Computing and Information Systems Students Association (CISSA)
- Engineering discipline-based clubs
- Engineering Music Society
- Engineers Without Borders (University of Melbourne chapter)
- Melbourne Space Program
- MUR Motorsports
- Pre-ENG & Information Technology Community
- Robogals
- Unimelb Rover Team
- Women in Science and Engineering (WISE)
- Women in Technology

Dion Kouskouris

Bachelor of Science, Mechatronics Engineering Systems major

Master of Mechatronics Engineering

"I was involved in building a smart Internet of Things (IoT) system prototype as part of the Telstra Student Partnership Project. Collaborating with Telstra was an opportunity to increase my technical and professional skills by working to solve a real-world problem."

Biomedical Engineering

Scan to learn more

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 engineering works at the intersection of engineering and biology, to understand and solve problems in medicine and human disease.

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

Where will this take me?

Biomedical engineers work in a range of industries, including biotechnology, health services, medical devices and pharmaceuticals. As a biomedical engineer, you could design a medical device or solve a clinical problem that helps patients in need.

Research examples

Drive research and education in medical technologies, health informatics and healthcare delivery. Examples of biomedical engineering research includes:

- Bionic eye
- Low-cost prosthetics
- Brain-computer interfaces
- Bioprinting and tissue engineering

"I've always been interested in learning how things work, so the BioDesign Innovation subject was a great way to explore and see how engineering and business can work together.

Now, I work as a biomedical engineer for Zyteq, a distributor of speech-generating devices, where I work with clients who need this technology to manage their day-to-day lives."

Janice Jarusdy Teguh

Bachelor of Science, Biomedical Engineering Systems major

Master of Biomedical Engineering (Business specialisation)

Master of Biomedical Engineering

Scan to learn more

Meet the health challenges of the future with a degree in Biomedical Engineering.

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.

You could develop your entrepreneurial ability by collaborating with business students and medical sector mentors. The collaboration could see you bring a medical device to market with the BioDesign Innovation subject.

Visit **go.unimelb.edu.au/d9fi** to read about Ventora Medical, a classroom concept turned successful startup who have raised $1.25 million to help babies breathe.

Graduate employment

You could work in the health sector at hospitals, biomedical institutes, medical agencies or governments. You'll be studying in the heart of the Melbourne Biomedical Precinct with the opportunity to meet and connect with startups and industry leaders.

Optional specialisation

Business

Subjects required:

- Engineering contracts and procurement
- Economic analysis for engineers
- Strategy execution for engineers
- Marketing management for engineers

Key info

Duration
2-3 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Becoming an accredited engineer

Accredited by
Engineers Australia
EUR-ACE

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Biomedical Engineering

If you have not completed a major in Biomedical Engineering Systems in your undergraduate degree, study the 3 year Master of Biomedical Engineering:

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

If you have completed a major in Biomedical Engineering Systems in your undergraduate degree, study the 2 year Master of Biomedical Engineering:

Year 1	Semester 1	Biomechanics	Bioengineering Data Analytics	Bioinstrumentation	Biomedical Engineering Management & Regulations
	Semester 2	Biofluid Mechanics	Biosignal Processing	Engineering Practice Selective Subject	Bioengineering Elective
Year 2	Semester 1	Biomedical Engineering Capstone Project	Bioengineering Elective	Bioengineering Elective	Bioengineering Elective
	Semester 2	Biomedical Engineering Capstone Project	Bioengineering Elective	Bioengineering Elective	Bioengineering Elective

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Chemical Engineering

Scan to learn more

What is chemical engineering?

Chemical engineering is concerned with developing and analysing process systems, which are strongly dependent upon chemistry and involve physical changes.

Chemical engineers change the world through the use of their knowledge of chemistry, biology, computation and engineering to meet the needs of our technological society.

- Focus on industrial-scale processes for converting raw waste materials into useful products, and learn how to simulate chemical processes.
- Apply your knowledge to areas such as fuel, plastics, food additives, fertilisers, paper and pharmaceuticals.
- Specialise in Business, Materials and Minerals or Sustainability and Environment during your studies to achieve your career goals.

Where will this take you?

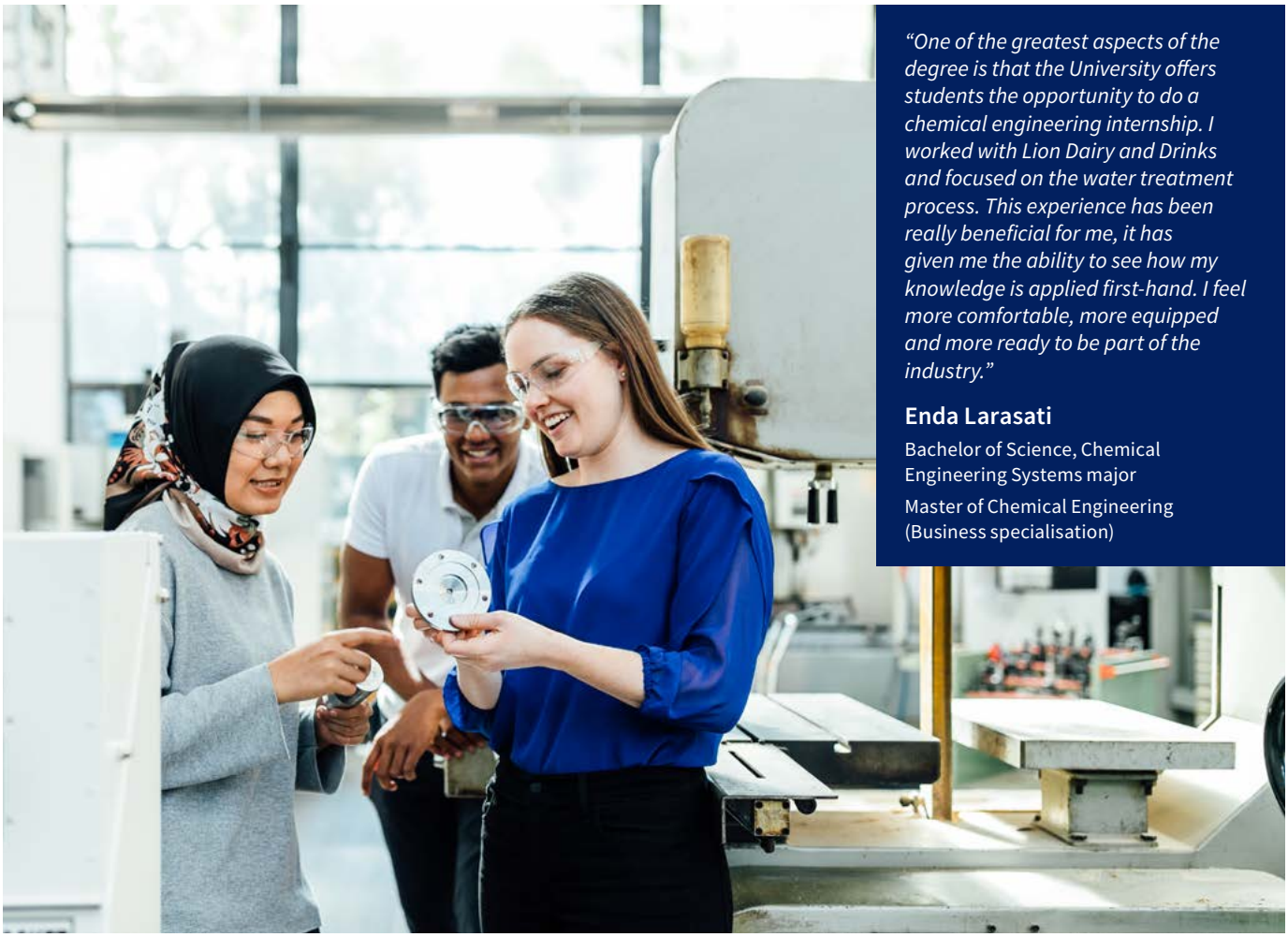
As a chemical engineer, you might focus on industrial-scale processes for converting raw waste materials into useful products, and learn how to simulate chemical processes. Or, you could apply your knowledge to areas such as fuel, plastics, food additives, fertilisers, paper and pharmaceuticals.

Research examples

Explore a diverse range of research applications across themes including, bioprocessing and food engineering, materials design and multiscale modelling, nano-medicine and biotechnology, and sustainable technologies, processing and remediation.

Examples of research in chemical engineering includes:

- Generating biofuels from algae
- Less waste in yoghurt production
- Keeping Antarctica clean
- Batteries that last longer



"One of the greatest aspects of the degree is that the University offers students the opportunity to do a chemical engineering internship. I worked with Lion Dairy and Drinks and focused on the water treatment process. This experience has been really beneficial for me, it has given me the ability to see how my knowledge is applied first-hand. I feel more comfortable, more equipped and more ready to be part of the industry."

Enda Larasati

Bachelor of Science, Chemical Engineering Systems major

Master of Chemical Engineering (Business specialisation)

Master of Chemical Engineering

Scan to learn more

With a degree in Chemical 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.

Internships and industry projects

Use your newly developed technical skills to solve a specific industrial problem with one of our partner companies in sectors including specialty chemicals, pulp and paper, water treatment and minerals processing.

You'll also have the opportunity to complete internships across a range of industries including:

- Energy
- Food and beverage production
- Minerals
- Pharmaceuticals

Optional specialisation

Sustainability and Environment

Subjects required for specialisation:

- Sustainable Processing
- Wastewater and Environmental Remediation
- Energy, Emissions and Pollution Control

Business

Subjects required for specialisation:

- Engineering Contracts and Procurement
- Strategy Execution for Engineers
- Marketing Management for Engineers

Materials and Minerals

Subjects required for specialisation:

- High Performance Materials
- Sustainable Minerals and Recycling
- Particle Technology

Key info

Duration

2-3 years

Intake

Semester 1 (February)
Semester 2 (July)

Designed for

Becoming an accredited engineer

Accredited by

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Cost

CSPs available
Full fee place guarantee available

Sample course plan

Master of Chemical Engineering

If you have not completed a major in Chemical Engineering Systems in your undergraduate degree, study the 3 year Master of Chemical Engineering:

Year 1	Semester 1	Fluid Mechanics	Fundamentals of Chemical Engineering	Material and Energy Balances	CCE or CIE or CIP
	Semester 2	Engineering Mathematics	Momentum, Mass and Heat Transfer	Digitisation in the Process Industries	Safety and Sustainability Case Studies

If you have completed a major in Chemical Engineering Systems in your undergraduate degree, study the 2 year Master of Chemical Engineering (Sustainability and Environment):

Year 2	Semester 1	Chemical Engineering Thermodynamics	Thermal and Separation Design	Reactors and Catalysis	Sustainable Processing
	Semester 2	Design and Construction of Equipment	Chemical Engineering Management	Wastewater and Environmental Remediation	Energy, Emissions and Pollution Control
Year 3	Semester 1	Process Engineering	Process Simulation and Control	Chemical Engineering Research Project or Internship	
	Semester 2	Chemical Engineering Design Project		Sustainable Minerals and Recycling	Pharmaceuticals and Biochemical Production

Core subjects **Elective subjects** **Specialisation core subject**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Civil and Structural Engineering

Scan to learn more

What is civil and structural engineering?

Civil engineering can cover a broad range of areas, such as transport, environmental and geotechnical engineering. Civil engineers plan, design and construct the built environment, providing essential services and infrastructure.

Structural engineering is a specialised type of civil engineering that focuses on the design and maintenance of load-bearing structures. Structural engineers design, develop, evaluate and assess risk of load-bearing structures in a variety of areas including construction, aerospace, natural resources and consulting.

Where will this take you?

You could work as a civil or structural engineer in industries such as aerospace, construction, oil and gas, transport and water resources. Our engineering graduates are working in organisations such as AECOM, BHP Billiton, City West Water, Golder Associates, Melbourne Metro Rail Authority and Shell.

As a civil engineer, you could work in urban development, transport and infrastructure, water resources and mining. You could be in a consulting role, or work as an engineering project manager.

Research examples

Our researchers contribute to the creation of sustainable infrastructure, delivering valuable benefits to the community, economy and environment.

Examples of research in civil and structural engineering:

- Prefabricated housing
- Going underground for green energy
- How nanoclay stops cladding fires from spreading
- Optimising urban transport systems from spreading
- Optimising urban transport systems

"World class lecturers and industry guests deliver a second to none experience enabling me to enter the industry with a high level of technical knowledge and a clear understanding"

Nathan Cheng

Bachelor of Science, Civil Engineering Systems major

Master of Civil Engineering

Master of Civil Engineering

Scan to learn more

Reimagine our growing cities with a degree in Civil Engineering. Prepare regions, cities and towns to handle increasing populations, finite resources and extreme events.

Strengthen your understanding of sustainable urban developments, environmental protection, resilient infrastructure design and the conservation of energy and water resources. You'll develop skills in structural, geotechnical, hydraulic and transportation engineering, as well as key knowledge in ports and harbour, energy, sustainability and project management.

Optional specialisation

Business

Subjects required for specialisation:

- Engineering Contracts and Procurement
- Economic Analysis for Engineers
- Strategy Execution for Engineers
- Marketing Management for Engineers
- World of Engineering Management

Energy

Subjects required for specialisation:

- Energy for Sustainable Development
- Solar Energy
- Energy Efficient Technology
- Sustainable Buildings

Structure

Subjects required for specialisation:

- Steel and Composite Structures Design

Plus 3 Structural Electives:

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

Key info

Duration
2-3 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Becoming an accredited engineer

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EUR-ACE

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Civil Engineering

If you have not completed a major in Civil Engineering Systems in your undergraduate degree, study the 3 year Master of Civil Engineering:

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

If you have completed a major in Civil Engineering Systems in your undergraduate degree, study the 2 year Master of Civil Engineering:

Year 1	Semester 1	Structural Theory and Design	Sustainable Infrastructure Engineering	Engineering Site Characterisation	Geotechnical Engineering
	Semester 2	Engineering Project Implementation	Civil Hydraulics	Transport Systems	System Modelling and Design
Year 2	Semester 1	Engineering Capstone Project Part 1	Integrated Design (Infrastructure)	Civil Engineering Elective	Civil Engineering Elective
	Semester 2	Engineering Capstone Project Part 2	Construction Engineering	Civil Engineering Elective	Civil Engineering Elective

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Master of Engineering Structures

Scan to learn more

What is a Master of Engineering Structures?

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.

You'll explore key themes such as structural systems, conceptual design, sustainable design, extreme loading and advanced analysis techniques.

Your subjects and lectures will be guided by specialists in infrastructure design, including earthquake and blast-resistant technologies. With in-house and guests seminar experts on leading structures research topics, you'll be able to undertake an infrastructure engineering research subject and complete simulated structures design exercises in collaboration with experienced senior engineers.

Key info

Duration
1 year

Intake
Semester 1 (February)
Semester 2 (July)

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

Cost
Full fee place guarantee available

Sample course plan

Master of Engineering Structures

Year 1	Semester 1	Rise Structures Infrastructure	Infrastructure Engineering elective	Structural Engineering elective	Structure Engineering elective
	Semester 2	Steel and Composite Structures Design	Structural Engineering elective	Structural Engineering elective	Structural Engineering elective

Core subjects Elective subjects

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Structural Engineering electives

Choose at least 3 subjects, 5 recommended

- Earthquake Resistant Design of Buildings
- Extreme Loading of Structures
- Design of Sustainable Structures
- Structural Dynamics and Modelling
- Building Information Modelling

Infrastructure Engineering electives

Choose up to 3

- Sustainable Infrastructure Engineering
- Quantitative Environmental Modelling
- Solar Energy
- Energy for Sustainable Development
- Project Management Practices
- Engineering Project Implementation
- Geotechnical Applications
- Energy Efficiency Technology
- Sustainable Buildings
- Engineering Contracts and Procurement
- IE Research Project 3
- Transport System Modelling
- Port Structural Design
- Port Access and Navigation
- Port and Harbour Engineering

Digital Infrastructure Engineering

Scan to learn more

What is digital infrastructure engineering?

Digital infrastructure engineering combines engineering and information technology. Digital infrastructure engineers work on digital systems representing our environments, resources and infrastructure to drive sustainable outcomes for businesses, projects and ecosystems. It's a blend of information technology, data science and analytics with engineering so you can manage infrastructure and industrial processes. Society needs these digital skills to help us map and model the world so we can make better decisions about our future.

Where will this take me?

You could work across any industry that can be improved with technology. You might fly a drone throughout a city to create a heat map and help people navigate the best route depending on the weather and improve our transport systems. You could use satellite imagery to assess a natural disaster and provide resources to those in need. Or help build better buildings by measuring how materials can be used sustainably and efficiently when designing our urban spaces.

Research examples

Researchers in digital infrastructure are working to develop and navigate AI, IoT and digitalisation technologies to address our growing infrastructure needs. Some examples include:

- Earth Observation and AI for disaster management
- Data analysis for climate neutral urban mobility
- Taking a city's pulse: urban data analytics and digital twins

"Digital infrastructure is the backbone of intelligent transportation systems – knowing when and where is enabling smart transport solutions, and graduates in this discipline will realise some of them. I would like to congratulate UoM for its leadership in recognising and responding to this need with the establishment of the new Master of Digital Infrastructure Engineering."

Susan Harris
CEO, ITS Australia

Master of Digital Infrastructure Engineering

Scan to learn more

Capture, integrate and use data representing our environments, resources and infrastructure with a Master of Digital Infrastructure Engineering. You'll work with the Internet of Things (IoT), design and use digital twins, and create digital solutions for asset management, smart and sustainable cities, and disaster management.

Optional specialisations

- Artificial Intelligence
- Business
- Communication Infrastructure
- Construction
- Cultural Heritage
- Energy
- Industry
- Information Systems
- Information Technology
- Land
- Mobility
- Smart Cities
- Sustainable Cities
- Water

Example: Artificial Intelligence
Subjects required for specialisation:

- Algorithms and Complexity
- Introduction to Machine Learning
- Statistical Machine Learning

Plus one elective:

- Computer Vision
- AI Planning for Autonomy

Example: Business
Subjects required for specialisation:

- Economic Analysis for Engineers
- Marketing Management for Engineers
- Strategy Execution for Engineers
- Management and Leadership for Engineers

Example: Land
Subjects required for specialisation:

- Property Law
- Cadastral Surveying
- Land Development

Plus one elective:

- Indigenous Land Management
- Planning Law and Statutory Planning

Key info

Duration
2-3 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Bridging Engineering and Information Technology to lead the digital transformation of the infrastructure sectors, in construction and surveying, and in spatial data analytics and AI.

Accredited by
Surveyors Registration Board of Victoria

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Digital Infrastructure Engineering

If you have not completed a major in Digital Infrastructure Engineering Systems in your undergraduate degree, study the 3 year Master of Digital Infrastructure Engineering:

Year 0	Semester 1	Sustainable Infrastructure Engineering	Engineering Risk Analysis	Applying Digital Infrastructure	Imagining the Environment
	Semester 2	Digital Systems for Infrastructure	Integrating Digital Infrastructure	Sensing and Measurement	Numerical Methods in Engineering

If you have completed a major in Digital Infrastructure Engineering Systems in your undergraduate degree, study the 2 year Master of Digital Infrastructure Engineering:

Year 1	Semester 1	Spatial Data Management	The Ethics of Artificial Intelligence	Spatial Data Analytics	Advanced Imaging
	Semester 2	Positioning Principles and Technologies	Building Information Modelling	Information Visualisation	Remote Sensing
Year 2	Semester 1	Specialisation subject	Specialisation subject	Creating Innovative Engineering	EMI Capstone
	Semester 2	Specialisation subject	Specialisation subject	Engineering Project Implementation	

Core subjects Elective subjects Specialisation

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Grad Cert Digital Engineering (Infrastructure)

Scan to learn more

The Graduate Certificate in Digital Engineering (Infrastructure) is designed to equip professionals with a solid foundation to create, capture and integrate data in a digitised work environment.

Why study a grad cert in digital infrastructure engineering?

In the move towards digital cities and the increasing use of digital engineering strategies and systems, digital engineering skills are highly sought-after. Advance your career in highly-skilled professions, including urban design, software and civil engineering, architecture, and Building Information Modelling.

Core subjects

Sensor Systems

Learn the principles of physical sensing mechanisms, sensor data processing and sensor networking. The Sensor Systems subject provides an appreciation of challenges in designing and implementing sensor-based solutions in a range of applications.

Advanced Imaging

The Advanced Imaging subject will introduce you to advanced imaging technologies and the methods for extracting quantitative information from multi-source imagery.

Building Information Modeling

Foster collaboration in designing infrastructures, minimise the risk of construction errors and optimise maintenance.

Information Visualisation

Use and design effective mechanisms for presenting and exploring the patterns embedded in large and complex data sets and support decision making.

Key info

Duration

1 year part-time

Intake

Semester 1 (February)
Semester 2 (July)

Designed for

Professionals who want to upskill in digital engineering. Ideal for those working in architecture, engineering and construction, facilities management, and connected industries

Electrical and Electronic Engineering

Scan to learn more

What is electrical and electronic engineering?

Electrical engineering is the central discipline involved in communications, including civil aviation and the deep space network, as well as in the medical field. Electrical engineers design and build electronic devices on all scales – from nanoelectronics to nationwide power grids. As an electrical engineer, you could:

- Develop new electronic materials that unlock high efficiency solar cells and new integrated circuits
- Design electrical and electronic devices and their algorithms to make smarter and higher performing systems
- Improve the operation of communication systems that connect and coordinate our daily operations

These systems underpin much of modern society with key applications including renewable energy power grids, autonomous systems, wireless communication and wearable electronics.

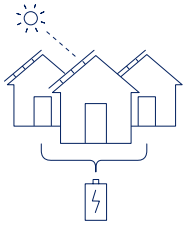
Where will this take me?

As an electrical engineer, you have the opportunity to work across a diverse range of industries, including telecommunications, defense, energy, automation, and many more. Our graduates are working for companies such as Accenture, Deloitte, Google, Telstra, and Tesla.

Research examples

Our researchers collaborate with industry and government in a wide range of areas, including communication systems and networks, control and signal processing, photonic and electronic systems, and power and energy systems. Here are some examples:

- 5G and the Internet of Things (IoT)
- Autonomous systems
- Next-generation solar cells
- Machine-learning in wireless spectrum allocation
- Renewable energy integration into power grids



#2 in Australia, #45 in the world

for Electrical and Electronic Engineering

QS World University Rankings by subject 2023

Andrew Dao

Bachelor of Science, Mechatronics Engineering Systems major

Master of Electrical Engineering

"The more I learn at the University of Melbourne, the more I see the power of engineering in our daily lives. Almost all devices we use every day result from the efforts of generations of scientists and engineers before us. I feel very fortunate to be a part of the next generation to build upon those efforts and help to create a prosperous society through technology.

The Master of Electrical Engineering has allowed me to develop critical thinking skills, which are crucial not just in engineering but in all aspects of life, no matter where I end up in the future. I wanted a degree that was taught proactively and could prepare me to apply my skills in the real world through a solid theoretical foundation."

Master of Electrical Engineering

Scan to learn more

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

Internships and industry partners

You could complete an internship in areas ranging from biotechnology to aerostructures, automation, power solutions and telecommunications.

Optional specialisation

Autonomous Systems

Focus on the areas of control systems and optimisation that underpin modern autonomous systems from robotics to UAVs.

Low-carbon Power Systems

Become an expert in operation, planning and design of low-carbon power systems and energy markets including renewables and smart-grid technology.

Electronics and Embedded Systems

Design and build electronic and opto-electronic systems for modern communications, computing, instrumentation and sensing.

Intelligent Communications and Networks

Discover the technology behind modern communication networks such as 5G, and the Internet of Things (IoT) and learn how to design the communication systems of the future.

Business

Developed in partnership with Melbourne Business School, you'll cover economics, marketing and finance and how they relate to engineering.

Key info

Duration
2-3 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Becoming an accredited engineer

Accredited by
Engineers Australia
EUR-ACE

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Electrical Engineering

If you have not completed a major in Electrical Engineering Systems in your undergraduate degree, study the 3 year Master of Electrical Engineering:

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

If you have completed a major in Electrical Engineering Systems in your undergraduate degree, study the 2 year Master of Electrical Engineering:

Year 1	Semester 1	Probability and Random models	Control Systems	Electronic Circuit Design	Introduction to Power Engineering
	Semester 2	Communication Systems	Signal Processing	Embedded Systems Design	Creating Innovative Engineering
Year 2	Semester 1	Electrical Engineering Capstone Project Part 1	Electrical Engineering Elective	Electrical Engineering Elective	Electrical Engineering OR Approved Elective
	Semester 2	Electrical Engineering Capstone Project Part 2	Electrical Engineering Elective	Electrical Engineering Elective	Electrical Engineering OR Approved Elective

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Master of Energy Systems

Scan to learn more

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

What is a Master of Energy Systems?

In a Master of Energy Systems, you'll learn to analyse energy systems from technical, commercial and policy standpoints to explore how we can finance, operate and manage renewable and non-renewable energy systems. You'll learn from specialists in electricity generation, the transport sector and energy networks.

Where will this take me?

Our graduates work in a diverse range of industries including automotive, solar energy, renewable energy, nuclear energy, and transport.

Electives:

Choose from a broad range of electives, including the Energy Systems Project and subjects from:

Energy and sustainability
- Adapting to Climate Change
- Climate Change Mitigation
- Climate Modelling and Climate Change
- Environmental Modelling
- Sustainable Buildings
- Solar Energy

Energy, finance and policy
- Climate Change Politics and Policy
- Engineering for Public Policy
- Environmental Policy Instruments
- Sustainability Reporting and Management

The business of energy
- Business Analysis and Decision Making
- Engineering Contracts and Procurement
- Optimisation for Industry
- Transport Systems

Energy and law
- Construction Law
- Energy Regulation and the Law

Energy systems project

You could choose to take the Energy Systems Project as an elective to work onsite at an organisation over three months to solve a real energy problem. You'll take on cross-disciplinary analysis and forge industry connections with energy companies, providers, distributors and market operators, or organisations specialising in alternative energy sources.

Key info

Duration
1.5 years

Intake
Semester 1 (February)

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

Cost
Full fee place guarantee available

Sample course plan

Master of Energy Systems

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

Core subjects Elective subjects

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

"During my energy systems project with the Australian Energy Market Operator (AEMO), I studied the impact of gas network interconnectivity on market prices. This is 'front and centre' news and extremely relevant to the market."

Farhad Billimoria
Master of Energy Systems

Master of Engineering Management

Scan to learn more

Fast-track your career in management, gain expertise in navigating organisational change and leading projects to achieve tangible results. You'll gain business skills to manage people, projects and resources in complex organisation settings.

Specialisations

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

Or you could focus on the Project Management stream to advance your understanding of project procurement, team leadership, risk management, communication, financial management and human resources.

Core subjects

Project Management subjects

Choose 2 of:

- Sustainable Infrastructure Engineering
- Project Management Practices
- Engineering Project Implementation
- Engineering Contracts and Procurement
- Transport System Modelling
- Engineering Risk Management

Change Management subjects

Choose 2 of:

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

Electives

- Supply Chain Management
- Management Competencies
- Accounting for Decision Making
- Business Analysis and Decision Making
- Financial Management
- Managerial Economics
- Operations and Process Management
- Human Resource Fundamentals

Key info

Duration

1 years

Intake

Semester 1 (February)
Semester 2 (July)

Designed for

Accredited engineers

"We had a guest lecturer from industry most weeks, so we were exposed to a lot of industry perspectives. It meant we didn't just learn the theory, but we also met the people who work in the field and heard about how they do it in real life.

My favourite subject was Change Management because it's very broad; I learned how to manage everything from end to end. It really helped prepare me for my future career."

Elisabeth Priscilla
Master of Engineering Management

Sample course plan

Master of Engineering Management

Year 1	Semester 1	Project/Change Management subject	Project/Change Management subject	Elective from the Master of Management	Elective from the Master of Management
	Semester 2	Strategic Management	Engineering Management capstone	Project/Change Management subject	Elective from the Master of Management

Core subjects Elective subjects Project/Change Management subject

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Environmental Engineering

Scan to learn more

What is environmental engineering?

Environmental engineering focuses on science and technology to protect our planet and make it a better place to live. Environmental engineers design and build sustainable solutions to tackle problems such as climate change, water scarcity, renewable energy, and bushfire management.

Where will this take me?

As an environmental engineer you could work in catchment management (e.g. Melbourne Water), conservation and natural resources (e.g. Alluvium Consulting), resource planning and management (e.g. Acciona), waste and water resources (e.g. Department of Environment, Land, Water and Planning), engineering consulting and more.

Research examples:

Some examples of the work our researchers are doing include:

- 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 Environmental Engineering

Master of Environmental Engineering

Scan to learn more

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.

Internships

Take our Internship subject and intern for companies and government organisations specialising in water resources management, environmental consulting and design, weather forecasting and more.

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.

Optional specialisation

Earth Observation

Students must choose 4 of the following:

- Application to Precision Agriculture
- Remote Sensing
- Information Visualisation
- Spatial Data Management
- Advanced Imaging
- Low-carbon Power Systems

Energy Systems

Students must choose 4 of the following:

- Solid Wastes to Sustainable Resources
- Energy Efficiency Technology
- Sustainable Buildings
- Energy for Sustainable Development
- Solar Energy

Water Systems

- Water and Wastewater Management
- Water Sensitive Urban Design
- Advanced Hydrological solutions
- Water Planning and an Uncertain Future
- Computational Fluid Dynamics
- Hydrogeology & Environmental Geochemistry

Key info

Duration

2-3 years

Intake

Semester 1 (February)
Semester 2 (July)

Designed for

Becoming an accredited engineer

Accredited by

Engineers Australia
EUR-ACE

Cost

CSPs available
Full fee place guarantee available

Sample course plan

Master of Environmental Engineering

If you have not completed a major in Environmental Engineering Systems in your undergraduate degree, study the 3 year Master of Environmental Engineering:

Year 0	Semester 1	Sustainable Infrastructure Engineering	Intro to Sustainable Water Systems	Fluid Mechanics	Analysis of Biological Data
	Semester 2	Environmental Engineering Systems Capstone	Earth Processes for Engineering	Engineering Mathematics	Environmental System Modelling and Design

If you have completed a major in Environmental Engineering Systems, study the 2 year Master of Environmental Engineering:

Year 1	Semester 1	Quantitative Environmental Modelling	Civil Hydraulics	Spatial Data Analytics	International River Basin Management
	Semester 2	Monitoring Environmental Impacts	Environmental Analysis Tools	Engineering Hydrology	Critical Communication for Engineers
Year 2	Semester 1	Engineering Capstone Project Part 1	Environmental Engineering Elective	Environmental Engineering Elective	Environmental Engineering Elective
	Semester 2	Engineering Capstone Project Part 2	Engineering Project Implementation	Environmental Engineering Elective	Environmental Engineering Elective

Core subjects Elective subjects Specialisation

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Master of Environmental Systems Engineering

Scan to learn more

Key info

Duration
2-3 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Becoming an accredited engineer

Accredited by
Engineers Australia
EUR-ACE

Cost
CSPs available
Full fee place guarantee available

Gain advanced knowledge in sustainable development and environmental management.

Elective themes:

Waste management
- Environmental Management
- Engineering Hydrology
- Infrastructure Engineering Research Project
- Solid Wastes to Sustainable Resources
- Water and Waste Water Management

Energy
- Energy Efficiency Technology
- Energy for Sustainable Development
- Infrastructure Engineering Research Project
- Solar Energy
- Sustainable Buildings

Water resources
- Infrastructure Engineering Research Project
- Water and Planning and an Uncertain Future
- Water and Waste Water Management
- Engineering Hydrology
- Computational Fluid Dynamics

Or, choose one approved elective, such as:

- Remote Sensing
- Foundations of Spatial Information
- Information Visualisation
- Advanced Imaging
- Applications in Precision Agriculture
- Project Management Practices
- Engineering Contracts and Procurement
- Metocean Engineering
- Port Access and Navigation
- Dredging Engineering
- Leadership for Innovation
- Internship
- Water Planning and an Uncertain Future
- Advanced Hydrological Solutions
- Hydrogeology & Environmental Geochemistry

Sample course plan

Master of Environmental Systems Engineering

Year 1	**Semester 1**	Quantitative Environmental Modelling	International River Basin Management	Elective	Elective
	Semester 2	Monitoring Environmental Impacts	Environmental Analysis Tools	Elective	Approved Elective

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Industrial Engineering

Scan to learn more

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. You'll 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 financial services and healthcare.

Where will this take me?

As an industrial engineer, you could work in a wide range of industries from manufacturing and processing to healthcare systems, banking and consulting.

Research examples

Our researchers are creating a competitive advantage across manufacturing and process industries by accelerating digital transformation and delivering holistic and integrated solutions for sustainable outcomes. Some examples of research in industrial engineering include:

- Sustainable manufacturing and life cycle engineering
- Digital transformation in industry
- Supply chain integration and reliability
- Innovative and integrated design for manufacturing

"My Master of Industrial Engineering program at the University of Melbourne was a great experience. The program was customised to fit my course, offering hands-on industry experience through projects and site visits. My favourite subjects were Industrial Systems and Simulation and Industrial Engineering. I learned how to apply concepts and understand the importance of process mapping, production systems and problem-solving through simulations. Now, working on a capstone project with Asahi, I can apply these skills to identify and solve real-world problems as an industrial engineer."

Benish SM Senthil
Master of Industrial Engineering

Master of Industrial Engineering

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

The Master of Industrial Engineering will give you advanced knowledge and skills in:

- Manufacturing processes and technology
- Manufacturing automation and information technology
- Industrial systems and simulation
- Sustainable and life cycle engineering
- Industry digital transformation and optimisation
- Business management.

Student experience

As an industrial engineering student, you will have access to a vast range of opportunities to network with industry, develop your professional skills and connect with a dynamic cohort of students from around the world. There are work-integrated learning projects so you can meet and work with industry partners or find a potential mentor. You'll be able to gain relevant work experience while you study to ensure you're ready to work as a graduate engineer.

Core subjects

The Master of Industrial Engineering is a 2-year (full-time) program consisting of 15 core subjects and one elective subject. Examples of your core subjects include:

Creating Innovating Engineering

Gain practical experience in, and theoretical insights into, elements of engineering innovation.

Industrial Systems and Simulation

Gain exposure to real world problems, participate in industry projects and engage with industry professionals through guest lectures.

Design and Manufacturing Practice

Work individually or in a team environment to design and manufacture a functional product.

Key info

Duration
2 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Becoming an accredited engineer

Accredited by
Engineers Australia
EUR-ACE

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Industrial Engineering

Year 1	Semester 1	Creating Innovative Engineering	Design and Manufacturing Practice	Manufacturing Process and Technology	Industrial Engineering
	Semester 2	Industrial Systems and Simulation	Operations and Process Management	Probability, Reliability and Quality	Manufacturing Automation and Information Technology
Year 2	Semester 1	Engineering Capstone Project Part 1	Optimisation for Industry	Supply Chain Management	Economic Analysis for Engineers
	Semester 2	Engineering Capstone Project Part 2	Sustainable and Life Cycle Engineering	Industry Digital Transformation	Engineering Contracts and Procurement

Core subjects Elective subjects

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Information Technology and Software Engineering

Scan to learn more

Transform the future of business, health, communication and entertainment with a degree in information technology or software engineering.

Research examples

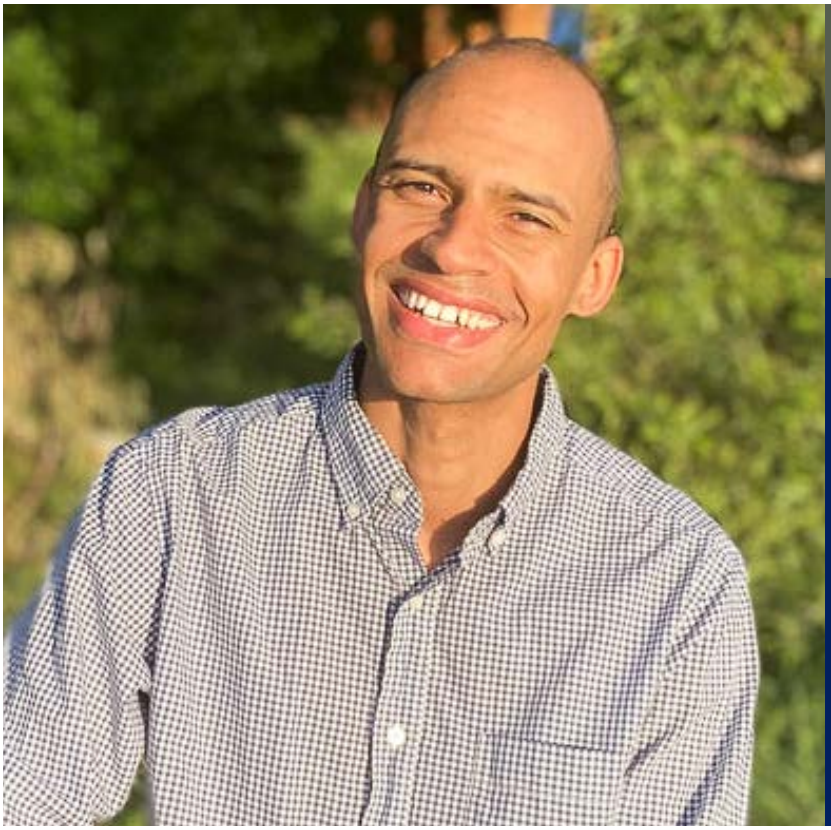
- Ageing in a virtual world
- Insertable and wearable technology
- Digital connectivity, crime and privacy
- Greener cloud computing
- Using AI in an ethical way that addresses privacy, manufacturing

Gain expertise in areas including:

- Information systems
- Human-computer interaction
- Software engineering
- Cybersecurity
- Artificial intelligence
- Data science
- Machine learning
- Distributed computing

Which information technology degree is right for me?

Program name	What it's all about?	Your career goal
Master of Software Engineering • Artificial Intelligence • Business • Cyber Security • Distributed Computing • Human Computer Interaction	Produce and manage complex or non-trivial large and small-scale software systems	Become an accredited software engineer
Master of Information Technology • Artificial Intelligence • Computing • Cyber Security • Digital Innovation • Distributed Computing • Human-Computer Interaction	Gain advanced technical skills and knowledge in information technology	Pursue a technical information technology career or advance your current information technology skills
Master of Information Systems	Support, manage and change business processes through information and communications technology	Pursue or advance your career in digital business
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



Jarrow Sarson- Lawrence
Master of Information Technology

"I took part in the industry placement with Western Health in their engineering department as part of the Internship subject. For this I went into the hospital three days a week. After this experience working on reliability using my IT skills, I saw the Telstra project as a good opportunity to build further on the same topic.

My project focused on detecting failures in Telstra's Internet of Things (IoT) tracking device, so I was able to bring my previous experience in engineering and my new IT skills to contribute in a productive way. I had enjoyed a previous subject taught by one of my supervisors so I thought it would be a good opportunity to delve deeper in the area."

Master of Software Engineering

Scan to learn more

Key info

Duration
2-3 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Becoming an accredited engineer

Accredited by
Engineers Australia
EUR-ACE
Euro-Inf
Australian Computing Society

Cost
CSPs available
Full fee place guarantee available

Learn how to produce and manage complex or non-trivial large and small-scale software systems, leveraging your scientific and technical knowledge.

You'll be guided by leading software experts to study algorithms, internet technologies and database systems so you have the skills to implement software engineering solutions.

Optional specialisation

As a Master of Software Engineering student, you have the option to specialise in one of five areas, including:

- Artificial Intelligence
  Gain expertise in designing, implementing, and analysing learning and reasoning machines, covering machine learning and digital ethics.
- Business
  Study tailored business subjects in partnership with the Melbourne Business School, exploring the intersections of economics, marketing, and finance with engineering.
- Cyber Security
  Develop technologies for improved security and reduced vulnerabilities in design systems, covering cryptography and security analytics.
- Distributed Computing
  Learn to manage data through networked computers, including distributed algorithms and parallel computing.
- Human Computer Interaction
  Evaluate interactive technologies, master interface design, and gain expertise in user experience and social computing.

Sample course plan

Master of Software Engineering

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

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

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

Year 1	Semester 1	Software Requirements Analysis	Computer Systems	Critical Communication for Engineers / Creating Innovative Engineering	CIS Advanced elective
	Semester 2	Masters Software Engineering Project	Security and Software Testing	CIS Advanced elective	CIS Advanced elective
Year 2	Semester 1	Masters Advanced Software Project	High Integrity Systems Engineering	Modelling Complex Software Systems	CIS Advanced elective
	Semester 2		Software Design and Architecture	CIS Advanced elective	CIS Advanced elective

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Master of Information Technology

Scan to learn more

Optional specialisations:

Specialisation	Overview	Focus on	Career opportunities
Artificial intelligence	Develop expertise in the design, implementation and analysis of systems that learn, plan and reason.	• Knowledge representation and planning • Machine learning • Data mining • Digital ethics • Security analytics	• Artificial Intelligence, machine learning and data science • Deep learning • Data mining • Business and data analytics
Computing	Focus on theoretical and applied computing where you could develop programming platforms for a career in app development, data analytics, games development and more.	• Theoretical and applied computing • Software development • Algorithmics • Databases and networking • Information technology project and change management	• 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.	• Software vulnerability discovery • Cryptography • Secure systems design and verification • Security analytics	• Security analytics, software and auditing • Cryptography • Forensics • Incident response • Network security
Digital Innovation	Learn advanced computing theories and methods for innovation and industry-based entrepreneurial practices.	• Problem discovery • Concept ideation • Innovation	• Entrepreneurship • Computing and digital innovation
Distributed computing	Learn to manage large quantitates of data through networked computers.	• Mobile computer systems programming • Cloud computing • High performance computing • Distributed algorithms • Parallel computing	• eBusiness and cloud computing • Mobile systems programming • Sensor networks
Human-computer interaction	Work with novel, interactive tech with systems people can use with intuitive user interfaces and evaluate different prototypes.	• User experience • Interaction design • Social computing • Information architecture • Ubiquitous computing	• UI development and engineering • VR, AR web and other information technology product design

Key info

Duration
1-2 years

Intake
Semester 1 (February)
Semester 2 (July)

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

Accredited by
Australian Computing Society

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Information Technology

Year 1	**Semester 1**	Internet Technologies	Programming and Software Development	Algorithms and Complexity	Data Systems and Information Modelling
	Semester 2	Distributed Systems	Cryptography and Security	Introduction to Machine Learning	Mobile Computing and Systems Progamming
Year 2	**Semester 1**	Distributed Algorithms	Software Processes and Management	Cluster and Cloud Computing	Declarative Programming
	Semester 2	Applied High Performance Computing	Parallel and Multicore Computing	Research Project or Software Project	

Foundation subject **Specialisation core** **Specialisation elective** **Advanced specialisation elective** **Advanced specialisation core**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Ziping (Pamela) Gao

Bachelor of Commerce

Master of Information Technology

"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."

Master of Information Systems

Scan to learn more

Key info

Duration
1-2 years

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Students from any undergraduate background

Accredited by
Australian Computing Society

Cost
CSPs available
Full fee place guarantee available

What is a Master of Information Systems?

The Master of Information Systems is a degree that utilises analysis, critical thinking and communication to produce a skill set for students to succeed in a business and ICT combined industry. You'll learn to explain real-world situations leading to information technology management decisions and develop a broad business and real-world perspective. This degree can lead to a job in information technology leadership and consulting, business analyst, enterprise architecture and more.

Course structure

You can focus your studies to gain experience with a capstone project or a research project. This gives you opportunities to complete internships, technology innovation projects with industry partners or research.

Electives

Choose up to four electives in areas such as:

- Industry experience, including an internship, industry placement or industry project
- Information technology change management
- Information technology service provision
- Business analytics
- Information technology innovation and interaction design
- Management
- Accounting and finance
- Human resources, operations and marketing
- Spatial information
- Health

Sample course plan

Master of Information Systems

Year 1	Semester 1	Concepts in Information Systems	Data Systems and Information Modelling	Digital Business analysis	Introduction to Programming
	Semester 2	Cyber Security Management	Professional IS Consulting	Skills for IS Research and Development	Elective
Year 2	Semester 1	Information Technology Project and Change Management	Enterprise Applications & Architectures	Elective	Elective
	Semester 2	IS Strategy and Governance	Elective	Capstone subject	

Core subjects Elective subjects Capstone

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

"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

Master of Data Science

Scan to learn more

Develop the technological abilities and analytical skills to manage and gain insights from large and complex collections of data. Use statistics tools and methods for in-depth analysis and solve problems using data. The Graduate Certificate in Data Science is also available as a pathway and you could be eligible for course credit.

Key info

Duration
2 years

Intake
Semester 1 (February)

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

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Data Science

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

Core subjects Elective subjects

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Master of Science (Bioinformatics)

Scan to learn more

Combine biology and information technology, blending genetics, molecular biology, biochemistry and physiology with computer science, statistics and applied mathematics. You'll take on a significant research project and choose from a stream in Biology and Biomedicine, Mathematics and Statistics, or Computer Science.

Key info

Duration
2 years

Intake
Semester 1 (February)
Semester 2 (July)

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

Cost
CSPs available
Full fee place guarantee available

Sample course plan

Master of Science (Bioinformatics)

Year 1	Semester 1	Introduction to Programming	Elements of Bioinformatics	Elements of Probability	Elective
	Semester 2	Elements of Statistics	Algorithms and Complexity	Elective	Bioinformatics Research Project part 1
Year 2	Semester 1	Statistics for Bioinformatics	Communication for Research Scientists	Genomics and Bioinformatics	Bioinformatics Research Project part 2
	Semester 2	Bioinformatics Case Study	Algorithms for Bioinformatics	Bioinformatics Research Projects part 3	

Core subjects Elective subjects

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Master of Computer Science

Scan to learn more

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.

You'll be guided by an academic expert as your supervisor with opportunities to network with and learn from world-learning computer science researchers.

Computer Science Research Project

Your Computer Science Research Project is an independent piece of research you can do with the support of an academic supervisor. You could work in areas like:

- Forest Crime Policing: Help protect Victorian rare or threatened species using selective sound monitoring devices to identify the hotspots affecting animal behaviour and habitats.
- 3D object recognition in autonomous driving: Self-driving cars are becoming more accessible, and you can be a part of developing the software to help autonomous vehicles navigate adverse visibility conditions.
- Design empathetically responsive voice assistants: Technology can help many people in different ways. You can develop software programs that will make voice assistants accessible, empathetic and responsive..
- Cane toad modelling in Australia: Australia's native ecosystems are precious and you could develop multiscale modelling to monitor invasive species like the cane toad and protect our natural environment.
- Measuring and mitigating gender bias in natural language processing: Machine learning relies on the data models that are programmed into it and you can make sure that they're representative of the real world through monitoring data elements like gender bias, language and communication styles.

Specialised Electives

In addition to your core subjects, you can gain specialist knowledge in areas such as:

- Advanced computer science
- Artificial intelligence (AI)
- Cybersecurity
- Human-computer interaction
- Programming languages & distributed systems
- Spatial information science

Key info

Duration

2 years

Intake

Semester 1 (February)
Semester 2 (July)

Designed for

Students who have a computer science background and the desire to get research experience.

Cost

CSPs available
Full fee place guarantee available

Sample course plan

Master of Computer Science

Year 1	Semester 1	Declarative Programming	Introduction to Machine Learning	The Ethics of Artificial Intelligence	Natural Language Processing
	Semester 2	AI Planning for Autonomy	Research Methods	Computer Vision	Machine Learning Applications for Health
Year 2	Semester 1	Computer Science Research Project Part 1	Computer Science Research Project Part 2	Computer Science Research Project Part 3	Computer Science Research Project Part 4
	Semester 2	Computer Science Research Project Part 1	Computer Science Research Project Part 2	Computer Science Research Project Part 3	Computer Science Research Project Part 4

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Grad Dip/Grad Cert Computer Science

Scan to learn more

Graduate Diploma in Computer Science

Duration
1 year

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Those seeking a pathway to the Master of Computer Science or looking for a computing qualification.

Graduate Certificate in Computer Science

Duration
6 months

Intake
Semester 1 (February)
Semester 2 (July)

Designed for
Those seeking a pathway to the Master of Computer Science.

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

- Augment your existing knowledge with technical expertise in computer science.
- Study a variety of programming paradigms and the software development cycle.
- Complete between four and six core subjects, with electives making a total of eight subjects.

The Graduate Certificate in Computer Science provides students with any undergraduate degree and significant programming/maths 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.

"I chose the Master of Computer Science because it was a broad topic area which encompassed many aspects such as machine learning, cryptography and more.

In their first year, students can explore the possible options for research areas and get in contact with supervisors and in second year, students can conduct serious research."

Yige Song
Bachelor of Science, Computing and Software Systems major
Master of Computer Science

Sample course plan

Graduate Diploma in Computer Science

Year 1	Semester 1	Internet Technologies	Algorithms and Complexity	Programming and Software Development	The Ethics of Artificial Intelligence
	Semester 2	Database Systems	Graphics and Interaction	Software Modelling and Design	Introduction to Machine Learning

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Mechanical and Mechatronics Engineering

Scan to learn more

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

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.

Research examples

- Physical human-robot collaboration
- Advanced and accessible prosthetics
- Improving the efficiency of aircraft
- 3D-printing to manufacture new body parts

Robocup Junior

The Department of Mechanical Engineering is the official sponsor and host of RoboCupJunior Victoria, a competition for young people that encourages the application of Artificial Intelligence (AI) and robotics research. The competition utilises engineering and information technology skills, as well as encouraging social development through sportsmanship, sharing, teamwork, cooperation, organisational skills, and understanding of differences between individuals and nations.

MUR Motosports and the Formula SAE

The Formula SAE program is an international series of competitions that challenge university student teams to design, build, race and justify an open wheeled, formula style racing vehicle. Since the inception of the local Australasian competition, the University of Melbourne has been competing in the event. MUR Motorsports, the University's representative team, design, build and race an electric race car every year. Undergraduate and masters students from across mechanical and electrical engineering compete against universities around the world.

Facilities

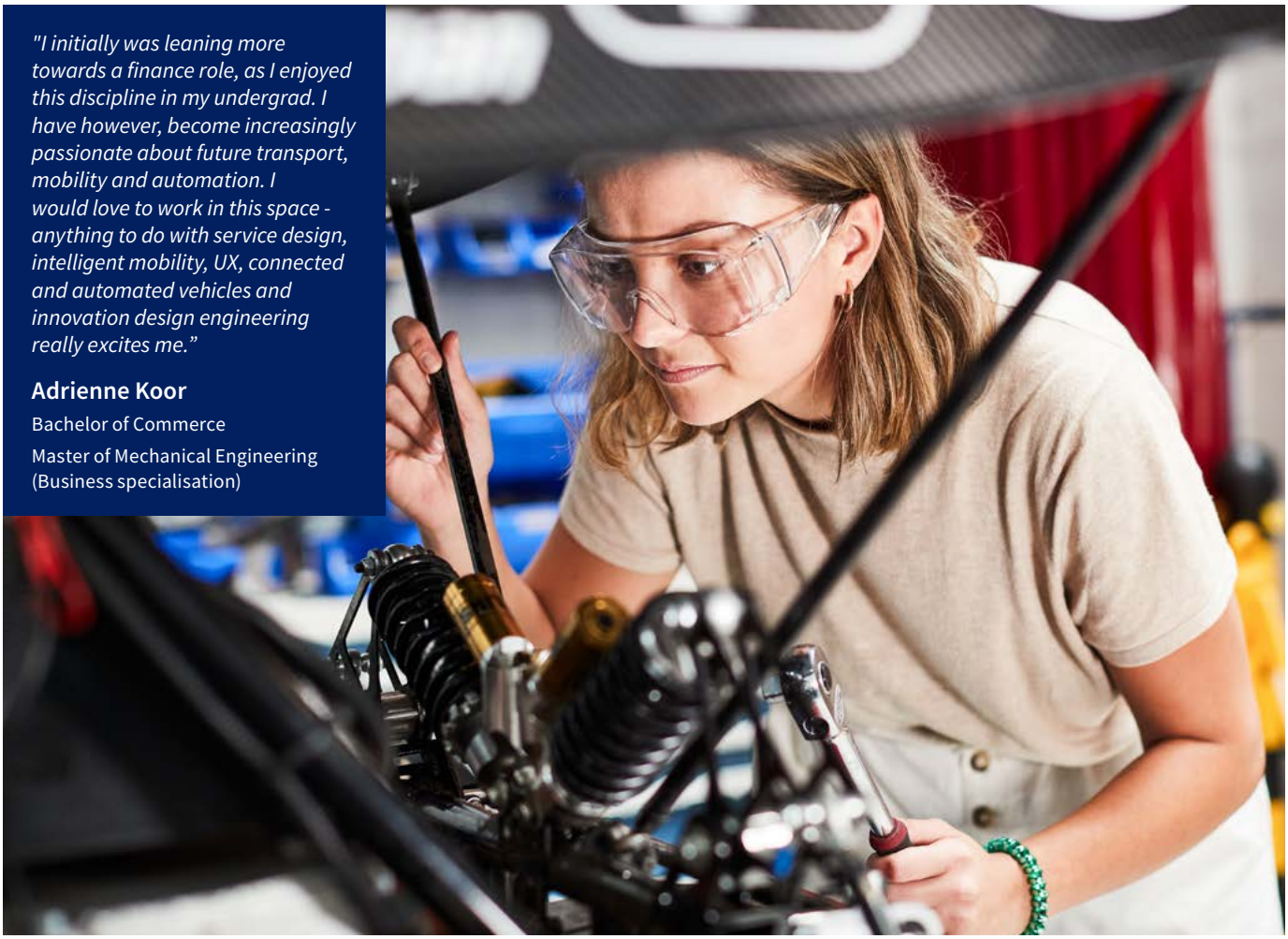
You'll have access to world-class facilities including wind tunnels, alternative fuel engines, rehabilitation robots, UAV platforms and large-scale water management systems.

"I initially was leaning more towards a finance role, as I enjoyed this discipline in my undergrad. I have however, become increasingly passionate about future transport, mobility and automation. I would love to work in this space - anything to do with service design, intelligent mobility, UX, connected and automated vehicles and innovation design engineering really excites me."

Adrienne Koor

Bachelor of Commerce

Master of Mechanical Engineering (Business specialisation)



Master of Mechanical Engineering

Scan to learn more

Optional specialisation

Business

Students must choose four of the following:

- Engineering Contracts and Procurement
- Economic Analysis for Engineers
- Marketing Management for Engineers
- Strategy Execution for Engineers
- World of Engineering Management
- Engineering Entrepreneurship

Aerospace

Subjects required for specialisation:

- Advanced Fluid Dynamics
- Aerospace Dynamics and Control
- Vibrations and Aeroelasticity
- Aerospace Propulsion

Manufacturing

Subjects required for specialisation:

- Manufacturing Processes and Technology
- Manufacturing Automation and Information Technology
- Industrial Engineering
- Probability, Quality and Reliability

Materials

Students must choose 4 of the following:

- Advanced Alloys and Polymers
- Advanced Materials
- Manufacturing Processes and Technology
- High Performance Materials

Key info

Duration

2-3 years

Intake

Semester 1 (February)
Semester 2 (July)

Designed for

Becoming an accredited engineer

Accredited by

Engineers Australia
EUR-ACE

Cost

CSPs available
Full fee place guarantee available

Sample course plan

Master of Mechanical Engineering

If you have not completed a major in Mechanical Engineering Systems in your undergraduate degree, study the 3 year Master of Mechanical Engineering

Year 0	**Semester 1**	Numerical Methods in Engineering	Engineering Mathematics	Foundations of Electrical Networks	Engineering Mechanics
	Semester 2	Mechanical Systems Design	Systems Modelling and Analysis	Thermodynamics and Fluid Mechanics	Mechanics and Materials
Year 1	**Semester 1**	Dynamics	Thermodynamics	Materials	Design and Manufacturing Practice
	Semester 2	Control Systems	Fluid Dynamics	Solid Mechanics	Elective
Year 2	**Semester 1**	Engineering Capstone Project part 1	Elective	Elective	Elective
	Semester 2	Engineering Capstone Project part 2	Elective	Elective	Elective

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Master of Mechatronics Engineering

Scan to learn more

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

You'll explore areas of technology development including robots, machine learning, autonomous systems and flexible manufacturing.

Optional specialisation

Manufacturing

Subjects required for specialisation:

- Manufacturing Processes and Technology
- Manufacturing Automation and Information Technology
- Industrial Engineering
- Probability, Quality and Reliability

Key info

Duration

2-3 years

Intake

Semester 1 (February)
Semester 2 (July)

Designed for

Becoming an accredited engineer

Accredited by

Engineers Australia
EUR-ACE

Cost

CSPs available
Full fee place guarantee available

"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 prosthetics 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

Bachelor of Science, Mechatronics Engineering Systems major

Master of Mechatronics Engineering

Sample course plan

Master of Mechatronics Engineering

If you have not completed a major in Mechatronics Engineering Systems in your undergraduate degree, study the 3 year Master of Mechatronics Engineering

Year 0	**Semester 1**	Engineering Mathematics	Engineering Mechanics	Foundations of Electrical Networks	Intro to Numerical Computation in C
	Semester 2	Programming and Software Development	Systems, Modelling and Analysis	Numerical Algorithms in Engineering	Mechanical Systems Design

If you have completed a major in Mechatronics Engineering Systems in your undergraduate degree, study the 2 year Master of Mechatronics Engineering

Year 1	**Semester 1**	Control Systems	Dynamics	Sensor Systems	Mechatronics Systems Design
	Semester 2	Embedded System Design	Programming and Software Development	Introduction to Machine Learning	Critical Communication for Engineers
Year 2	**Semester 1**	Advanced Elective	Advanced Elective	Advanced Elective	Capstone project
	Semester 2	Advanced Elective	Advanced Elective	Advanced Elective	Capstone project

Core subjects **Elective subjects**

These are sample course plans only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

Specialisations

Scan to learn more

What is a specialisation?

A specialisation is an optional set of subjects within a particular field of your choosing that can complement your degree.

You can choose a specialisation that pertains to a particular career path or industry of interest.

For example: if you are studying the Master of Electrical Engineering, you could choose to specialise in Low-Carbon Power Systems to become a power system practitioner.

What are the benefits?

- Develop sought after skills and expertise in your specialised area for a career of your choosing.
- Study subjects that are tailored to your preferred line of interest in the course and chosen career pathway.
- Graduate with ready knowledge of your career pathway.
- Gain tailored industry experience within your specialisation.

When do you pick a specialisation?

The timeline for choosing a specialisation can differ between courses, most degrees will ask you to choose your specialisation by your second year. However, some courses, like the Master of Electrical Engineering, will ask you to choose your specialisation within the first semester of your commencement within the course.

As choosing a specialisation will impact all your core subjects, for some courses it is advised to make a choice at the start of your degree.

Where can a specialisation take me?

There are autonomous systems operating in virtually all industries and many of our daily lives. Did you know 40% of water diverted into irrigation networks is wasted?* Control engineers from the University of Melbourne and Rubicon Water developed a distributed feedback control system to reduce water loss from irrigation helping to improve the health of our waterways and make farming more sustainable. This is just one example of where a specialisation could take you.

***Futurumcareers.com**

Endeavour Exhibition

Scan to learn more

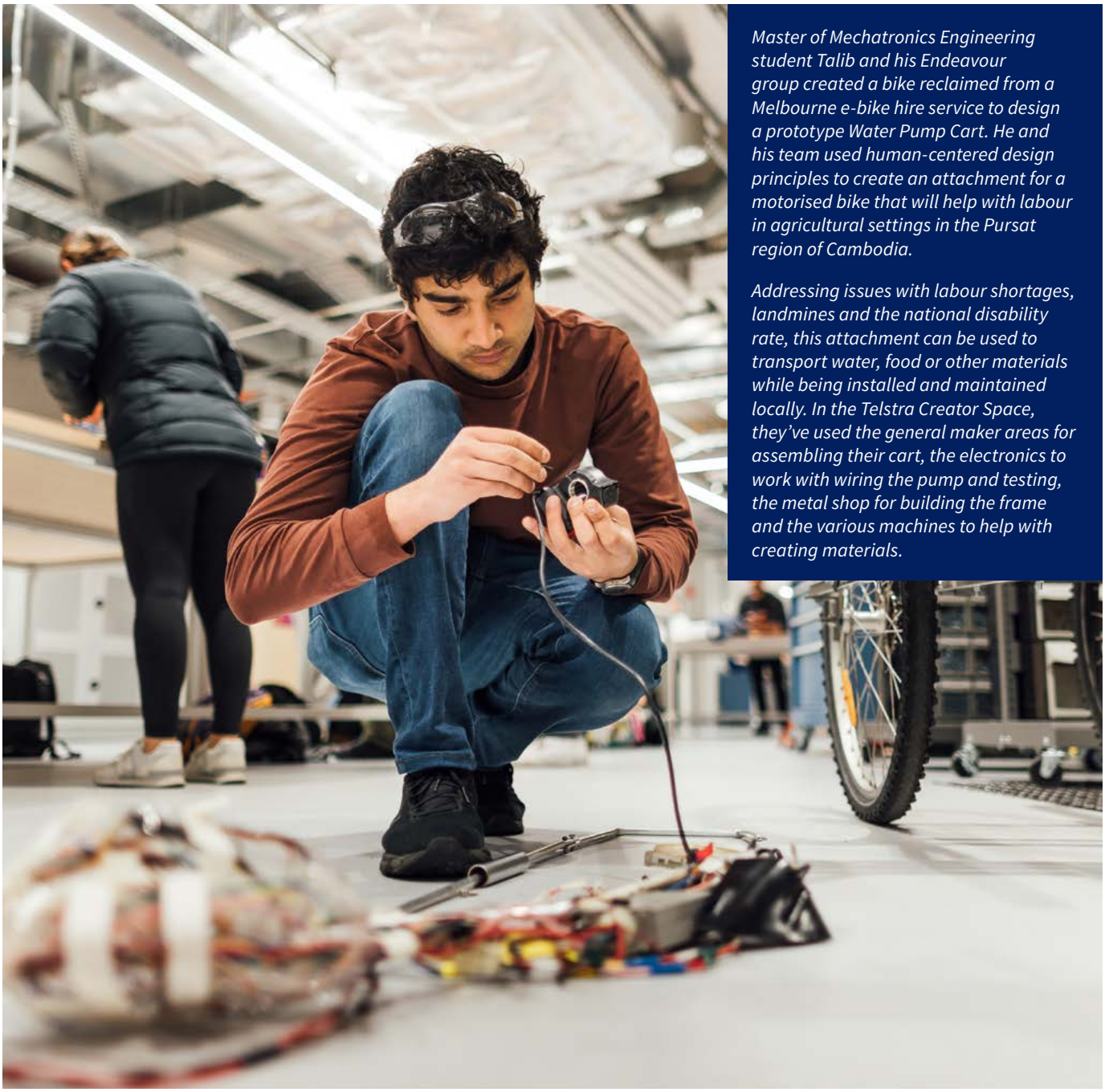
The Endeavour Exhibition is a showcase of final year student work where you can discover the industry and research projects created by our engineering and information technology masters students.

Masters students across the faculty partner with our industry networks, government and research groups over the course of a semester or a year, to solve problems and discover new ways of working. You'll take what you learn in the classroom – and apply it to a real problem.

The exhibition showcase happens twice a year and we invite our partners, students and the public to meet our students and see their work.

There are industry and faculty awards and prizes to recognise everyone's hard work and the public can get involved to choose a People's Choice Award winner.

Throughout the semester, you can attend workshops to help with your presentation skills and networking, and you'll create a poster to present your work. You could also present a prototype or simulation of your project.



Master of Mechatronics Engineering student Talib and his Endeavour group created a bike reclaimed from a Melbourne e-bike hire service to design a prototype Water Pump Cart. He and his team used human-centered design principles to create an attachment for a motorised bike that will help with labour in agricultural settings in the Pursat region of Cambodia.

Addressing issues with labour shortages, landmines and the national disability rate, this attachment can be used to transport water, food or other materials while being installed and maintained locally. In the Telstra Creator Space, they've used the general maker areas for assembling their cart, the electronics to work with wiring the pump and testing, the metal shop for building the frame and the various machines to help with creating materials.

Telstra Creator Space

Scan to learn more

The Telstra Creator Space offers various specialised areas dedicated to different aspects of the creation process.

Spanning two floors, this space is equipped with 3D printers, laser cutters, electronics workbenches featuring oscilloscopes, functional generators, power suppliers, soldering stations, and a reflow oven for printed circuit boards.

For traditional woodworking tasks like cutting, turning, sanding, and shaping wood and plastics, the Wood Shop provides the necessary tools.

Similarly, the Metal Shop contains traditional metal fabrication machines suitable for cutting, bending, drilling, grinding, and assembling steel and aluminium structures.

Additionally, there are CNC machines, as well as manual milling and lathe machines, which offer insights into the machinery used in various industries.

Operated by industry professionals, the Telstra Creator Space offers equipment training and support to assist you in transforming your ideas into prototypes.

The Telstra Creator Space is continuously evolving to meet the ever-changing demands of the industry, ensuring that graduates are equipped with the latest fabrication methods and technologies.

Check out a virtual tour of the Telstra Creator Space here: **https://go.unimelb.edu.au/7djs.**

Engineering and Information Technology research degrees

Scan to learn more

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 research project under the supervision of world-class researchers. You will have access to multiple opportunities to shape your future as an academic, industry professional or entrepreneur. You can engage in internships, undertake specialist professional development for researchers and showcase your work at conferences and networking events. Combined with the infrastructure, supervisory and collegial expertise in your lab/workshop/centre and our commitment to foster innovation and sustainability, you will forge the next stages of your career.

Research disciplines

Discipline	Research themes	Our graduate research students work on
Biomedical engineering	• Biomaterials and Tissue Engineering • Biomechanics and Mechanobiology • Biomedical Imaging • Neural Engineering • Systems and Synthetic Biology • Biomicrosystems	• Multi-scale cardiac mechanobiology and systems biology • Biofabrication and matrix mechanobiology of cartilage tissue models • Developing advanced biomaterials for stem cell manufacturing and tissue engineering applications • Use of Deep Learning computational methods to characterise cancer burden in PET imaging • Novel electrodes for brain computer interfaces • Transcranial magnetic brain stimulation for depression • Wearable assistive technologies to enhance performance and mitigate injury
Chemical engineering	• Electrochemistry • Materials development • Separations technology • Surface chemistry and rheology • Bioprocessing	• Next-generation fertilisers • Digital bioprocessing, including mechanistic and AI models of biopharmaceutical manufacturing processes • Green hydrogen production and conversion to future fuels • Water and energy-efficient mineral processing • Advance polymeric synthesis and their uses in tissue engineering, drug delivery, and other industrial applications
Computing and information systems	• Artificial Intelligence • Computer Science • Human-Computer Interaction • Information Systems	• Machine Learning • Generative AI • Efficient Cloud Computing • Information Security Management • Algorithms • Health Informatics and Digital Health • Ethics and Societal Impact of IT • Games, Play, and Extended Reality
Electrical and electronics engineering	• Communications and networks • Control and signal processing • Photonic and electronic systems • Power and energy systems	• Games, Machine learning, and Coding for wireless communications • Optical communication systems – access networks, human-to-machine, hybrid fibre-wireless • Nano-wire, nano-photonic devices and chiral light matter interactions • Real-time simulation and optimisation of smart distribution systems • Estimation and control for robotic systems • Networked control systems • Integrating communications and sensor technologies • Integrated planning of electricity-gas-hydrogen systems • Optimisation and ML for Industry 4.0 • Optimisation and control of community energy systems and microgrids • Quantum machine learning
Infrastructure engineering	• Civil engineering • Geomatics • Environmental hydrology and water resources	• Life-cycle structures protection and management • Engineering physical and data infrastructures to harness ocean wind power • New and emerging technologies for design, operation, and management of transport systems • 3D digital mapping for land and property • Urban analytics, sustainability and smart city • Sustainable management of water and energy in changing climate • Emerging Earth observation technologies and sustainable solutions to environmental challenges
Mechanical engineering	• Robotic and Autonomous Systems • Biomechanics • Fluid Dynamics • Thermodynamics • Material Design and Engineering • Design, Manufacturing and Industrial Engineering	• Human and animal biomechanics • Air-sea interaction • Large scale energy systems • Assistive and rehabilitation robotics • Low emission transport • Dexterous robotic hands and neuroprostheses • modelling and experimentation of production variability • Modular product design and optimisation • Cutting edge energy systems • Design of graphene membranes for desalination • Computing mechanical properties of material defects • Fluid mechanics in the reduction of airborne infectious viral load

Master of Philosophy

Duration: Typically 1.5 years full-time

Doctor of Philosophy (PhD)

Duration: Typically at least 3-3.5 years full-time

How to apply

Applications can be submitted at any time, but make sure to check the deadlines for each scholarship selection round. You must secure an academic supervisor prior to making an application and supply documented evidence.

For more information, go to
go.unimelb.edu.au/439r

Finding a project/supervisor

To search for available PhD projects and supervisors, go to
findanexpert.unimelb.edu.au

Entry requirements

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 mark equivalent to the University of Melbourne's 75% is the minimum entry requirement. However, an average mark of 80-85% is more competitive for scholarships. Please note that "competitive grades" do not guarantee admission.

Scholarships

You'll be automatically considered for many scholarships when you apply, and there are other scholarships or awards that may require a separate application.

Scholarships include:

- **Melbourne Research Scholarship:** all applicants are automatically considered for the Melbourne Research Scholarship. This scholarship provides a living allowance for up to 3.5 years, fee remission for up to 4 years, relocation allowance, and overseas health cover for international students. To view the full benefits of the scholarship, go to **go.unimelb.edu.au/ouh6**
- Ingenium Scholarship: this Ingenium scholarship is open to high achieving domestic students. It provides an annual top-up scholarship and a generous professional development fund. Check the instructions on how to apply: **go.unimelb.edu.au/uf4s**

Treating real-world injuries with virtual reality

Although the Computer Assisted Rehabilitation Environment (CAREN) resembles an immersive video game, this unique technology is changing how we approach injury prevention and treatment. Housed in the Faculty of Engineering and IT's MedTech Linkway, CAREN 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, and as they move, the muscles they are using light up. Researchers can also collect information about muscle and brain activity through electromyography (EMG) and electroencephalography (EEG), assisting the rehabilitation of stroke patients.

With such diverse capabilities, CAREN 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.

Fees and scholarships for Graduate Coursework degrees

Scan to learn more

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).

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 information technology) 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

For more information about fees, scholarships and more, visit: **go.unimelb.edu.au/jpb6**

Scholarships

Scholarship	Eligible Courses	Total value
Airwallex Excellence in Technology Scholarship	• Master of Information Technology • Master of Information Systems • Master of Computer Science • Master of Software Engineering	$30,000
Agilent Scholarship for Women in STEM	• Master of Electrical Engineering • Master Mechanical Engineering • Master of Mechatronics Engineering • Master of Software Engineering	$20,000
Loxton Scholarship in Engineering	Completion of an undergraduate degree leading to a Master of Chemical Engineering	$20,000
Pearson William Tewksbury Scholarship	Completion of an undergraduate degree leading to a Master of Chemical Engineering	$20,000

"The Future Engineer Prize has me hopeful about the future and meeting with the sponsors helps me feel connected to the faculty and university community. The financial support means I can spend more time on campus and focus on my studies."

Joseph Alkarra

Bachelor of Science, Mechatronics Engineering Systems major

Master of Mechatronics Engineering

How to apply

Scan to learn more

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 71**).

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.

Research applications

For information related to engineering and information technology research degree applications, **please see page 46**.

Application closing dates

Semester 1: February

All Professional Masters applicants: 30 November

Includes:

- Master of Engineering
- Master of Information Systems
- Master of Computer Science
- Master of Information Technology

International Specialised Masters applicants: 30 December❷

Domestic Specialised Masters applicants: 30 January❷

Semester 2: July

All Professional Masters applicants: 30 April

Includes:

- Master of Engineering
- Master of Information Systems
- Master of Computer Science
- Master of Information Technology

International Specialised Masters applicants: 30 April❶

Domestic Specialised Masters applicants: 30 May❶

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

	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: **go.unimelb.edu.au/iq8e**

❶ Please note, the Master of Energy Systems is only offered for entry in Semester 1.

❷ Specialised masters courses include the Master of Engineering Structures, Master of Environmental Systems 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.

THE UNIVERSITY OF
MELBOURNE

Get to know us better
in your own time

CRICOS Provider Code: 00116K

RFQ 08069