THE UNIVERSITY OF MELBOURNE

Undergraduate Engineering and IT Guide

# Discover Engineering and IT in 2025

# Contents

# Create your own path

**At Melbourne, you can build a degree around your interests and strengths, while having the flexibility to specialise when you're ready.**

Aligned with leading universities across Europe, North America and Asia, our course structure encourages you to develop both well-rounded skills and deep expertise in your chosen discipline.

You'll have access to internships, industry-based learning and the opportunity to connect with a global community. Graduate with a globally recognised qualification as well as the knowledge and experience to make an impact in your career, wherever that may take you.

The path is yours to create.

**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

*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).*

# Why choose Engineering or Information Technology?

### Engineering and Information Technology at Melbourne

Select majors, electives, and breadth subjects that align with your chosen career from day one or explore a range of diverse subjects to discover new passions.

You'll graduate with both an undergraduate and a professionally accredited masters degree giving you a higher-level qualification that is recognised by employers globally.

At Melbourne, you will be learning from world-leading researchers who are working on ground-breaking innovations such as epileptic seizure prediction, chemical blankets to protect our coral reefs and robots with a human touch.

Gain valuable industry experience with internship opportunities, real-world projects and exciting innovation challenges with industry mentors.

Working alongside students from over 100 countries around the world, you'll start building your own global network at Australia's leading university.

## What is breadth?

In addition to the subjects offered in your core area of study, you can also take subjects from other disciplines, or test out subjects you're thinking of pursuing in a graduate degree.

Breadth allows you to explore beyond your study area to build an interdisciplinary skillset, so you'll be capable of critical thinking, problem-solving, communication and leadership in a vastly broad range of professions.

### Flexible and focused course structures

Focus on your chosen career from day one or take the time to explore where your passions and strengths lie – through majors, electives and breadth subjects.

### Immersive and hands-on learning experiences

Work alongside world-renowned academics, researchers and industry experts, while using the latest technologies, tools and research to become a true innovator in your field.

### Graduate ready to make an impact

Graduate with the confidence to launch straight into your career. Maximise your career opportunities around the world with Engineers Australia, EUR-ACE accreditation and more.



❶ QS World University Rankings 2024
❷ QS Graduate Employability 2022

# How to study Engineering at Melbourne

Start with a three-year undergraduate degree, majoring in your chosen field of engineering. Then progress to a two-year engineering masters degree to become an accredited engineer, enabling you to practice in Australia and around the world.

If you meet the maths and science entry requirements for a masters degree in engineering but haven't completed the required engineering subjects in your undergraduate degree, you will be eligible for the three-year engineering masters program.

<table>
<tr><th>Undergraduate study: 3 years full-time study</th><th>Graduate study: 2-3 years depending on your previous study</th></tr>
<tr><td>Bachelor of Biomedicine</td><td rowspan="8">Master of Engineering<br>• Biomedical<br>• Chemical<br>• Civil<br>• Digital Infrastructure<br>• Electrical<br>• Environmental<br>• Industrial<br>• Mechanical<br>• Mechatronics<br>• Software</td></tr>
<tr><td>• Complement your engineering skills with medical knowledge<br>• Contribute to solving problems in the life sciences, from improving health outcomes to minimising threats to life<br><br>Majors in the Bachelor of Biomedicine:<br>• Biomedical Engineering Systems</td></tr>
<tr><td>Bachelor of Design</td></tr>
<tr><td>• Explore how we interact with the world<br>• Rethink the way we approach our cities, public spaces, transport, technology, digital spaces and the environment<br><br>Majors in the Bachelor of Design:<br>• Civil Engineering Systems<br>• Computing and Software Systems<br>• Digital Infrastructure Engineering Systems<br>• Mechanical Engineering Systems</td></tr>
<tr><td>Bachelor of Science</td></tr>
<tr><td>• Understand how science underpins engineering<br>• Complement your major with studies in genetics, ecology, food science, neuroscience and more<br><br>Majors in the Bachelor of Science:<br>• Biomedical Engineering Systems<br>• Chemical Engineering Systems<br>• Civil Engineering Systems<br>• Computing and Software Systems<br>• Digital Infrastructure Engineering Systems<br>• Electrical Engineering Systems<br>• Environmental Engineering Systems<br>• Mechanical Engineering Systems<br>• Mechatronics Engineering Systems</td></tr>
<tr><td>Bachelor of Commerce</td></tr>
<tr><td>Prerequisites:<br>• Use your breadth to complete four prerequisite subjects<br>• Must include Linear Algebra and Calculus 2 or equivalents, along with two science subjects relevant to intended specialisation</td></tr>
</table>

# How to study Information Technology at Melbourne

Choose an undergraduate degree with a major in information technology or focus on related subjects. Then, take your career to the next level with a master's degree. Some of our specialisations combine engineering and information technology, such as artificial intelligence, computer science, digital innovation, distributed computing, human-computer interaction, and software.

As an information technology student, you'll experience a curriculum designed in consultation with leading industry decision-makers and taught by world-leading experts, with opportunities for industry placements.

Become equipped to work in diverse settings, from your own start-up to multinational corporations, government and the not-for-profit sector.

<table>
<tr><th>Undergraduate study: 3 years full-time study</th><th>Graduate study: 2-3 years depending on your previous study</th></tr>
<tr><td>Bachelor of Commerce</td><td rowspan="10">Master of Computer Science<br><br>Master of Data Science<br><br>Master of Digital Infrastructure Engineering<br>Optional specialisations: Artificial Intelligence, Business, Communication Infrastructure, Construction, Cultural Heritage, Energy, Industry, Information Systems, Information Technology, Land, Mobility, Smart Cities, Sustainable Cities, Water<br><br>Master of Information Systems<br>Optional specialisations: Professional or Research<br>* Research options are available for eligible students<br><br>Master of Information Technology<br>Specialisations: Artificial Intelligence, Computing, Cybersecurity, Digital Innovation, Distributed Computing, Human-Computer Interaction<br><br>Master of Mechatronics Engineering<br>Optional specialisation: Manufacturing<br><br>Master of Software Engineering<br>Optional specialisations: Artificial Intelligence, Computing, Cybersecurity, Distributed Computing, Human-Computer Interaction<br><br>Graduate Certificate in Computer Science (6 months)<br><br>Graduate Diploma in Computer Science (1 year)<br><br>Graduate Diploma in Infrastructure (Digital) (1 year)</td></tr>
<tr><td>Prerequisites:<br>• Students must use their breadth subjects to complete at least one first-year programming subject to be eligible for the Master of Information Technology</td></tr>
<tr><td>Bachelor of Design</td></tr>
<tr><td>Majors in the Bachelor of Design:<br>• Computing and Software Systems<br>• Digital Infrastructure Engineering<br>• User Experience Design</td></tr>
<tr><td>Bachelor of Science</td></tr>
<tr><td>Majors in the Bachelor of Science:<br>• Computing and Software Systems<br>• Data Science<br>• Digital Infrastructure Engineering<br>• Mechatronics Engineering Systems</td></tr>
<tr><td>Information Technology as breadth</td></tr>
<tr><td>• In any Melbourne degree</td></tr>
<tr><td>Diploma in Computing</td></tr>
<tr><td>• An extra semester to complement your degree</td></tr>
</table>

# Explore your study options

Scan to learn more

**Do you love innovation and discovering how things work? Are you passionate about inventing, designing and creating solutions for society? A global career in Engineering and Information Technology might be for you.**

Engineering and Information Technology skills are applicable across almost every sector, from health care right through to manufacturing. There are many career pathways you could take, and the following themes are just a few examples. You may study areas not listed here or find other unique ways to apply your talents within your chosen industry.

If you're interested in…

## Medicine and health

We need to explore chemical processes to understand how we can produce life-saving drugs or how the body will respond to biomedical treatment. The equipment and processes in hospitals need to be efficient and streamlined to ensure that patients get the care they need. Robots and software can also play a key part in keeping patient information secure, or conducting specialised surgery with more accuracy than a human hand.

### You could consider:

- Biomedical Engineering Systems
- Chemical Engineering Systems
- Mechanical Engineering Systems

## Data science, artificial intelligence and cybersecurity

Our computers are in the cloud, robots can write novels, and artificial intelligence (AI) is being used for intelligent decision making in almost every industry. If you're interested in how technology is shaping the future of our work, entertainment, education and businesses, then you'll need an understanding of how we gather, interpret and use data.

### You could consider:

- Computing and Software Systems
- Digital Infrastructure Engineering Systems
- Electrical Engineering Systems
- Mechatronics Engineering Systems

## Transport, disaster response or power systems

Transport systems help people move from one place to another. They require a lot of information about the local environment, community needs and physical infrastructure. If there's a natural disaster, how can we respond to get people to safety or supply resources to those in need? If you're interested in how we can design and plan our power systems to build better cities, engineering will give you career options in many industries.

### You could consider:

- Civil Engineering Systems
- Digital Infrastructure Engineering Systems
- Electrical Engineering Systems
- Mechanical Engineering Systems

## Food and our diets

Farmers need to maximise how much food they can grow, with equipment that can plant and harvest efficiently. We need to understand the chemical basis of food and how our bodies respond in order to maintain a healthy diet and we need to make sure we are doing the right thing by local environments to grow food sustainably.

### You could consider:

- Chemical Engineering Systems
- Environmental Engineering Systems
- Industrial Engineering

## Processes and product design

A warehouse might need to process goods in a quick and efficient way. You could design the mechanical infrastructure and the automation to keep things moving. You could design digital or physical products and optimise every step of the way.

### You could consider:

- Biomedical Engineering Systems
- Chemical Engineering Systems
- Industrial Engineering
- Mechanical Engineering Systems
- Mechatronics Engineering Systems

## Sustainability

How do we make the most efficient use of our resources without compromising on our environmental resources and our future generations? Sustainable engineering requires adapting existing processes, finding new ways of doing things and helping address climate change in how we build and support our natural environment.

### You could consider:

- Chemical Engineering Systems
- Digital Infrastructure Engineering Systems
- Environmental Engineering Systems
- Industrial Engineering

## Communications and networks

Whether you're making a tiny circuit board for a pocket device, or designing the networks that connect our cities globally, communications and networks need all kinds of engineers at different scales. You might find a way to improve our satellite communication, create a new version of Google Maps or build a better smartphone.

### You could consider:

- Digital Infrastructure Engineering Systems
- Electrical Engineering Systems
- Computing and Software Systems

## Robotics and automation

Robots are getting smarter and faster every day and you could use control systems and information technology to change the way humans work, or how we produce goods. Whether you want to write code to get a robot to do something for you, or analyse how we can do things more efficiently, engineering skills will be important for how technology is changing many industries.

### You could consider:

- Computing and Software Systems
- Electrical Engineering Systems
- Mechatronics Engineering Systems

## Building, infrastructure and urban planning

Our cities need to support the local environment and meet the needs of those who live there. How can we design cities and infrastructure that maximise the needs of the people, while supporting sustainable building practice? Whether you're interested in water systems, construction, bridges or roads, engineers are an important part of urban and community projects.

### You could consider:

- Civil Engineering Systems
- Environmental Engineering Systems
- Industrial Engineering

# Biomedical Engineering

Scan to learn more

Meet the health challenges of the future with a degree in biomedical engineering. Biomedical engineering offers a mix of innovation, impact, and interdisciplinary collaboration to address global health challenges.

## What is biomedical engineering?

Biomedical engineering blends engineering with biology and medicine to create breakthroughs in healthcare from advancing diagnostic tools to designing life-saving medical devices.

## What should I study?

Start with an undergraduate degree with a major in Biomedical Engineering Systems (3 years full-time), then progress to a Master of Biomedical Engineering (2-3 years full-time). This major is available in the following undergraduate degrees:

- Bachelor of Biomedicine
- Bachelor of Science

## Student experience

As a biomedical engineering student, you could intern at a hospital or biomedical research institute, work on an innovation challenge with an industry mentor through the Innovation Practice Program or experience entrepreneurship with the BioDesign Innovation subject. You'll have the chance to work alongside researchers on projects or explore your own interests in capstone and summer project subjects.

## Your career

Access career opportunities as a biomedical engineer in industries such as biotechnology, hospitals, R&D, startups, pharmaceuticals, medical devices and other health services. Our graduates are working at organisations such as the Bionics Institute, Seer Medical, Medtronic, Stryker, Chemtronics, Cochlear and 4DMedical.

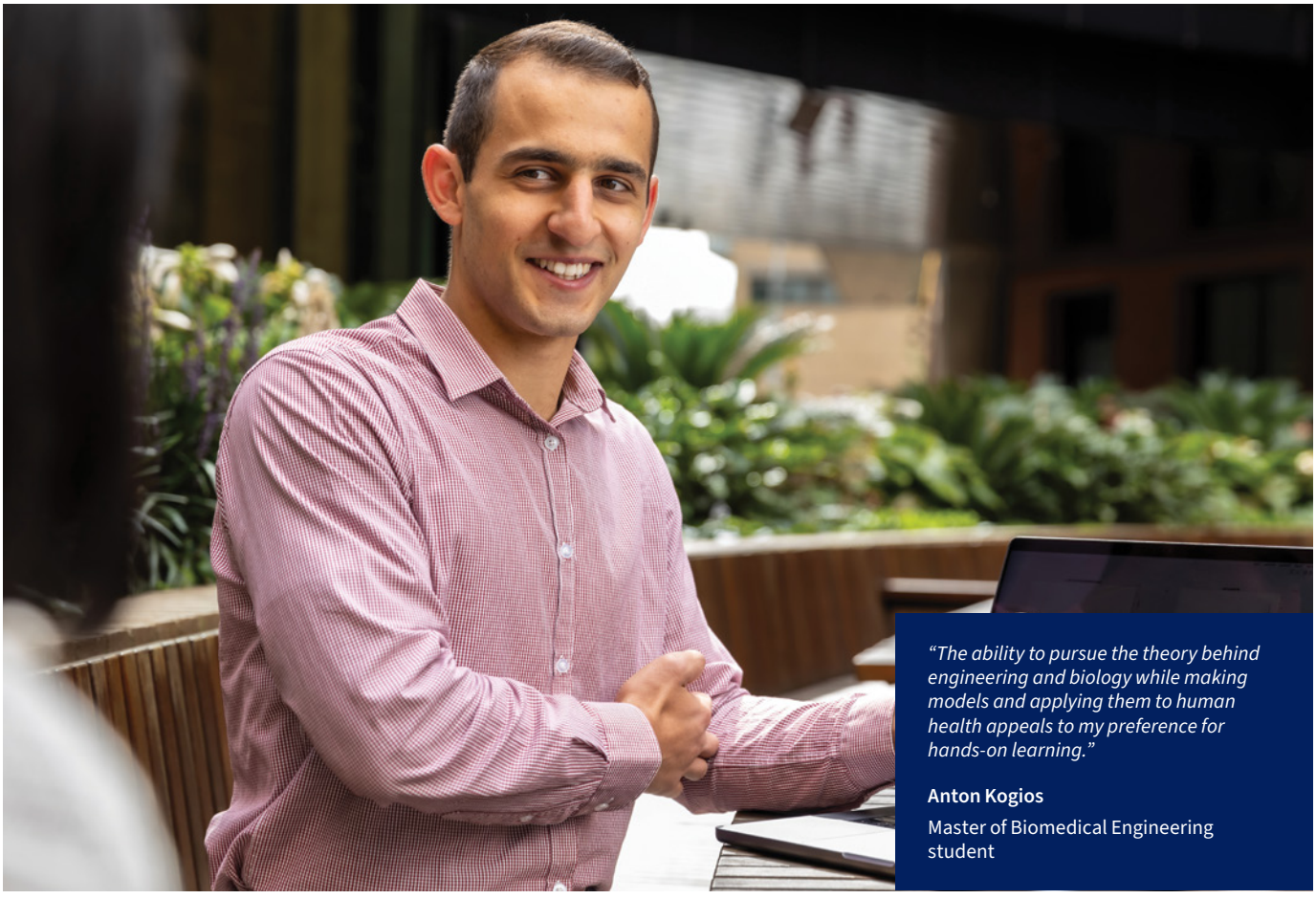
## Optional specialisations

- Business: Study tailored business subjects in partnership with the Melbourne Business School covering economics, marketing and finance that relate to engineering.

## 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
- Biomedical imaging technologies



*"The ability to pursue the theory behind engineering and biology while making models and applying them to human health appeals to my preference for hands-on learning."*

**Anton Kogios**

Master of Biomedical Engineering student

## Sample course plan

### Step 1: Study Biomedical Engineering Systems

Bachelor of Biomedicine (Biomedical Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Engineering Technology and Society | Calculus 2 | Biomolecules and Cells | Discovering Biomedicine |
| | Semester 2 | Exploring Biomedicine | Linear Algebra | Chemistry for Biomedicine | Engineering Modelling and Design |
| Year 2 | Semester 1 | Applied Computation for Bioengineering | Molecular and Cellular Biomedicine | | Breadth |
| | Semester 2 | Engineering Mathematics | Human Structure and Function | | Breadth |
| Year 3 | Semester 1 | Mechanics for Bioengineering | Circuits and Systems | Biomedicine: Molecule to malady | Breadth |
| | Semester 2 | Introduction to Biomaterials | Biosystems Design | Frontiers in Biomedicine | Breadth |

**Core subjects** **Breadth 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.

### OR

Bachelor of Science (Biomedical Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Engineering Technology and Society | Calculus 2 | Biology: Life's Machinery | Today's Science, Tomorrow's World |
| | Semester 2 | Engineering Modelling and Design | Linear Algebra | Chemistry 1 | Breadth |
| Year 2 | Semester 1 | Engineering Mathematics | Applied Computation in Bioengineering | Science Elective | Breadth |
| | Semester 2 | Anatomy and Physiology for Bioengineering | Science Elective | Science Elective | Breadth |
| Year 3 | Semester 1 | Mechanics for Bioengineering | Circuits and Systems | Science Elective | Breadth / Science Elective |
| | Semester 2 | Introduction to Biomaterials | Biosystems Design | Science Elective | Breadth / Science Elective |

**Core subjects** **Elective subjects** **Breadth 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.

### Step 2: Master of Biomedical Engineering

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Applied Computation in Bioengineering | Mechanics for Bioengineering | Circuits and Systems | Biology: Life's Machinery |
| | Semester 2 | Anatomy & Physiology for Bioengineering | Introduction to Biomaterials | Biosystems Design | Chemistry 1 |
| Year 2 | Semester 1 | Biomechanics | Bioengineering Data Analytics | Bioinstrumentation | Biomedical Eng Management and Regulations |
| | Semester 2 | Biofluid Mechanics | Biosignal Processing | Biomedical Engineering Elective | Creating Innovative Professionals |
| Year 3 | Semester 1 | Biodesign Innovation | Biodesign Innovation | Medical Imaging | Soft Tissue and Cellular Biomechanics |
| | Semester 2 | Biodesign Innovation | Biodesign Innovation | Neural Information Processing | Tissue Engineering & Stem Cells |

**Core subjects** **Elective subjects**

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### Step 3: Enter into employment with professional accreditation

# 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 by implementing new digitalised processing, safety and circular economy considerations.

## What is chemical engineering?

Chemical engineers use their understanding of chemistry and biology to create solutions in resources and a circular economy, recycling and waste stream management, energy supply, food and pharmaceutical production, and water treatment solutions.

## What should I study?

Start with an undergraduate degree with a major in Chemical Engineering Systems (3 years full-time), then progress to a Master of Chemical Engineering (2-3 years full-time). This major is available in the following undergraduate degree:

- Bachelor of Science

## Your career

Access career opportunities as a chemical engineer in industries such as manufacturing, food and beverage production, future fuels, renewables and energy storage, pharmaceuticals, waste recycling and water treatment. Our engineering graduates are working at organisations such as Bulla Dairy Foods, Carlton & United Breweries, CSL, ExxonMobil, Mars Chocolate Australia and Melbourne Water.

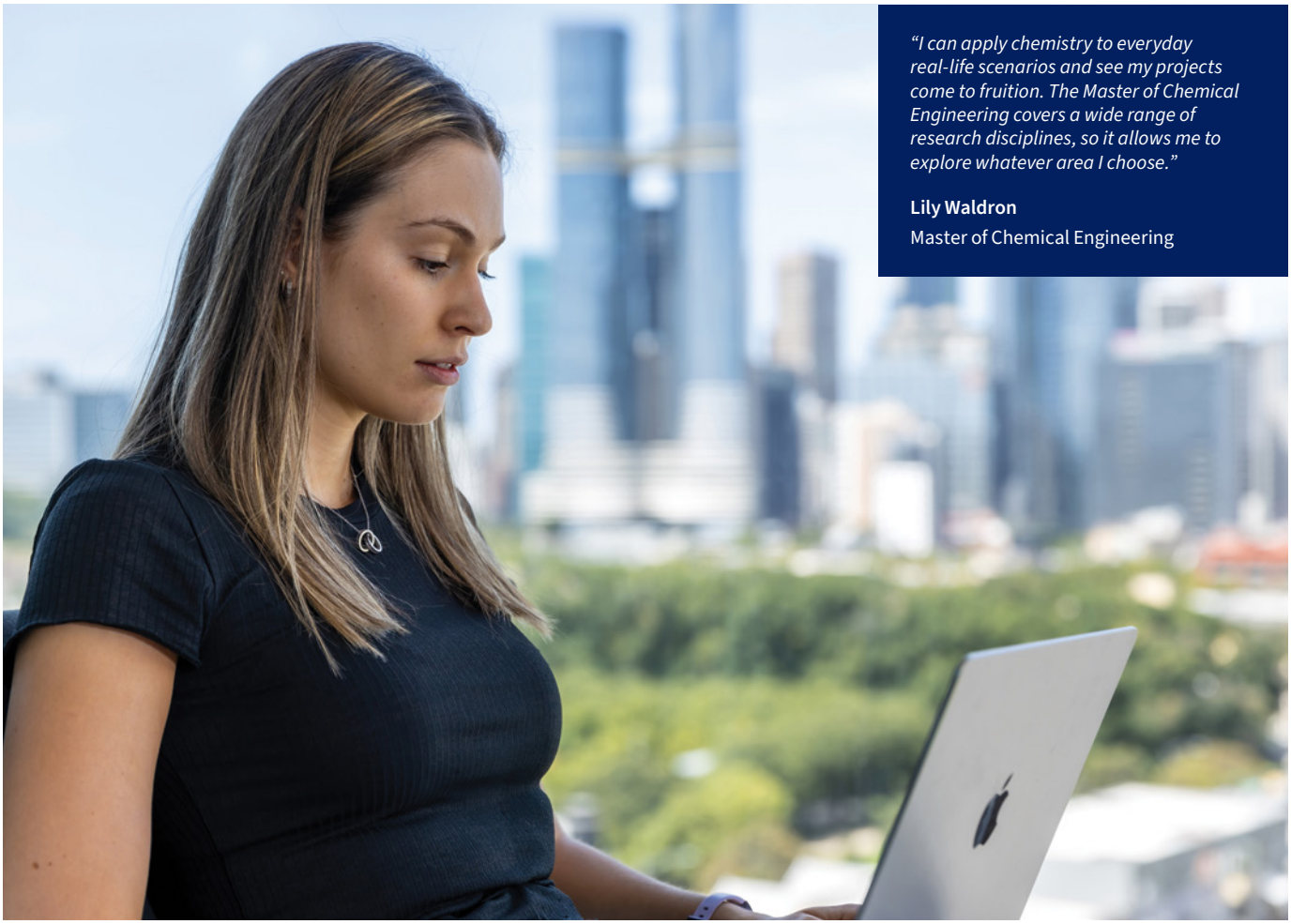
## Optional specialisations

- Business: Study tailored subjects on economics, marketing and finance.
- Materials and minerals: Explore the technology that underpins materials production or mineral processing.
- Sustainability and environment: Address the challenges in producing sustainable fuels, foods and chemicals for the future.

## Research examples

Explore a diverse range of research applications across themes including, bioprocessing and food engineering, materials design and multiscale modelling, nanomedicine and biotechnology, and sustainable technologies, processing and remediation. Examples of research in chemical engineering includes:

- Generating biofuels from algae
- Keeping Antarctica clean
- Batteries that last longer
- Improving efficiency of food production



*"I can apply chemistry to everyday real-life scenarios and see my projects come to fruition. The Master of Chemical Engineering covers a wide range of research disciplines, so it allows me to explore whatever area I choose."*

**Lily Waldron**
Master of Chemical Engineering

## Sample course plan

### Step 1: Study Chemical Engineering Systems

Bachelor of Science (Chemical Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| **Year 1** | **Semester 1** | Engineering Technology and Society | Calculus 2 | Chemistry 1 | Today's Science, Tomorrow's World |
| | **Semester 2** | Engineering Modelling and Design | Linear Algebra | Chemistry 2 | Breadth / Science Elective |
| **Year 2** | **Semester 1** | Fundamentals of Chemical Engineering | Material and Energy Balances | Science Elective | Breadth / Science Elective |
| | **Semester 2** | Digitisation in the Process Industries | Engineering Mathematics | Science Elective | Breadth / Science Elective |
| **Year 3** | **Semester 1** | Reactors & Catalysts | Fluid Mechanics | Science Elective | Breadth / Science Elective |
| | **Semester 2** | Momentum, Mass and Heat Transfers | Safety and Sustainability Case Studies | Science Elective | Breadth / Science Elective |

**Core subjects** **Elective subjects** **Breadth 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.

### Step 2: Master of Chemical Engineering (Sustainability and environment specialisation)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | 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 2 | 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** **Breadth 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.

### Step 3: Enter into employment with professional accreditation

# Civil Engineering

**Scan to learn more**

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

## What is Civil Engineering?

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

## What should I study?

Start with an undergraduate degree with a major in Civil Engineering Systems (3 years full-time), then progress to a Master of Civil Engineering (2-3 years full-time). This major is available in the following undergraduate degrees:

- Bachelor of Design
- Bachelor of Science

## Your career

You could work as a civil 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.

## Optional specialisations

You can choose to specialise in one of seven specialisations, or you can choose not to specialise if you prefer:

- Business
- Energy
- Geotechnical
- Project Management
- Structural
- Transport
- Water Resources

## 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 engineering:

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

*"I really enjoyed the Construction Engineering subject that I took because it was very practical to the engineering workforce. It was not only about theory but also seeing how things are built."*

**Stella Han**
Bachelor of Design
Master of Civil Engineering

## Sample course plan

### Step 1: Study Civil Engineering Systems

Bachelor of Design (Civil Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Calculus 1 | Linear Algebra | Design Elective | Breadth |
| | Semester 2 | Calculus 2 | Statics | Design Elective | Breadth |
| Year 2 | Semester 1 | Sustainable Infrastructure Engineering | Foundations of Computing | Design Elective | Breadth |
| | Semester 2 | Engineering Mechanics and Materials | Earth Processes for Engineering | Engineering Mathematics | Breadth |
| Year 3 | Semester 1 | Fluid Mechanics | Engineering Risk Analysis | Design Elective | Breadth / Design Elective |
| | Semester 2 | Systems Modelling and Design | Structural Theory and Design | Design Elective | Breadth / Design Elective |

**Core subjects** **Elective subjects** **Breadth 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.

### OR

Bachelor of Science (Civil Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Today's Science, Tomorrow's World | Calculus 2 | Science Elective | Engineering Technology and Society |
| | Semester 2 | Engineering Modelling and Design | Linear Algebra | Science Elective | Breadth |
| Year 2 | Semester 1 | Sustainable Infrastructure Engineering | Engineering Mathematics | Foundations of Computing | Breadth |
| | Semester 2 | Engineering Mechanics and Materials | Earth Processes for Engineering | Science Elective | Breadth |
| Year 3 | Semester 1 | Fluid Mechanics | Engineering Risk Analysis | Science Elective | Breadth / Science Elective |
| | Semester 2 | Systems Modelling & Design | Structural Theory & Design | Science Elective | Breadth / Science Elective |

**Core subjects** **Elective subjects** **Breadth subjects** **Recommended 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.

### Step 2: Master of Civil Engineering

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Structural Theory and Design 2 | Engineering Site Characterisation | Transport Infrastructure Engineering | Geotechnical Engineering |
| | Semester 2 | Engineering Project Implementation | Civil Hydraulics | Transport Systems | Creating Innovative Engineering |
| Year 2 | Semester 1 | Engineering Capstone Project Part 1 | Integrated Design | 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.

### Step 3: Enter into employment with professional accreditation

# Digital Infrastructure Engineering

**To find out more scan this QR code**

Capture, integrate and use data in a digital work environment. 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.

## 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.

## What should I study?

Start with an undergraduate degree with a major in Digital Infrastructure Engineering Systems (3 years full-time), then progress to a Master of Digital Infrastructure Engineering (2-3 years full-time). This major is available in the following undergraduate degrees:

- Bachelor of Design
- Bachelor of Science

## Your career

The infrastructure sector in Australia is booming and digital engineering tools like Building Information Modelling (BIM), IoT and virtual reality are increasingly being used. With digital systems becoming required in many industries, you can meet the demand for skilled people to assist with the transition to digital strategies and systems.

*"With the Digital Infrastructure Engineering Systems major I get to play with cities, model them, map them and actually see what happens when we build things a certain way. I think it's great fun. I love it!"*

**Tara Shokouhi**

Digital Infrastructure Engineering Systems major

## Optional specialisations

- Artificial Intelligence: Apply core digital infrastructure skills in machine learning and computer vision.
- Business: Study tailored business subjects developed in partnership with the Melbourne Business School.
- Communication Infrastructure: Discover networks like 5G and the IoT.
- Construction: Improve how we build and manage buildings using data such as digital twins.
- Cultural Heritage: Use technology to see how we can learn from or improve cultural heritage.
- Energy: Design digital systems for sustainable energy.
- Industry: Explore entrepreneurial business ideas.
- Information Systems: Combine information technology and digital business skills for organisational change.
- Information Technology: Become an expert in programming, internet and digital architecture.
- Land: Interpret surveys on land ownership and combine skills in culture, law and planning.
- Mobility: Improve how we move and build efficient systems.
- Water: Manage our water resources in a sustainable way.

## 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:

- Satellite imagery and AI for disaster management
- Data analysis for climate neutral urban mobility
- Taking a city's pulse: urban data analytics and digital twin

## Sample course plan

### Step 1: Study Digital Infrastructure Engineering Systems

Bachelor of Design (Digital Infrastructure Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Calculus 2 | Engineering Technology and Society | Elective | Elective |
| | Semester 2 | Linear Algebra | Engineering Modelling and Design | Elective | Breadth |
| Year 2 | Semester 1 | Sustainable Infrastructure Engineering | Applying Digital Infrastructure | Algorithms and Data Structures | Breadth |
| | Semester 2 | Sensing and Measurement | Numerical Methods in Engineering | Artificial Intelligence | Breadth |
| Year 3 | Semester 1 | Imaging the Environment | Engineering Risk Management | Planning Scenario and Policy Workshop | Breadth/Design Elective |
| | Semester 2 | Digital Systems for Infrastructures | Integrating Digital Infrastructure | Smart Transportation | Breadth/Design Elective |

**Core subjects** **Elective subjects** **Breadth subjects** **Recommended 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.

### OR

Bachelor of Science (Digital Infrastructure Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Calculus 2 | Today's Science, Tomorrow's World | Engineering Technology and Society | Foundations of Computing |
| | Semester 2 | Linear Algebra | Engineering Modelling and Design | Foundations of Algorithms | Breadth |
| Year 2 | Semester 1 | Sustainable Infrastructure Engineering | Applying Digital Infrastructure | Algorithms and Data Structures | Breadth |
| | Semester 2 | Sensing and Measurement | Numerical Methods in Engineering | Artificial Intelligence | Breadth |
| Year 3 | Semester 1 | Imaging the Environment | Engineering Risk Analysis | Disaster Resilient City | Breadth / Science Elective |
| | Semester 2 | Digital Systems for Infrastructures | Integrating Digital Infrastructure | Smart Transportation | Breadth / Science Elective |

**Core subjects** **Elective subjects** **Breadth subjects** **Recommended 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.

### Step 2: Master of Digital Infrastructure Engineering

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

**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.

### Step 3: Enter into employment with professional accreditation

# Electrical Engineering

Scan to learn more

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

## What do electrical and electronic engineers do?

Electrical engineers design and manage the electrical systems that meet the practical needs of our world. This includes autonomous systems, electronics, power distribution, sensors, telecommunications and information processing. As a graduate, you'll have analytical skills, knowledge of the latest technologies and the ability to work on large and small scale systems.

## What should I study?

Start with an undergraduate degree with a major in Electrical Engineering Systems (3 years full-time), then progress to a Master of Electrical Engineering (2-3 years full-time). This major is available in the following undergraduate degree:

- Bachelor of Science

## Your career

You could work as an electrical engineer in industries such as automation, broadcast or sound engineering, power generation and transmission, and telecommunications.

Our engineering graduates work in organisations such as Accenture, AECOM, Deloitte, ExxonMobil, Google, Tesla and Telstra.

## Optional specialisations

- Autonomous Systems: Develop methods and approaches to design and control autonomous systems from robotics to drones.
- Business: Complement your core electrical engineering subjects with a set of subjects covering economics, marketing and finance.
- Intelligent Communications and Networks: Discover the technologies behind communication networks like 5G and IoT, and learn how to design the communication systems for the future.
- Electronics and Embedded Systems: Design and build the electronic, embedded and opto-electronic systems for applications in modern communications, computing, instrumentation and sensing.
- Low-carbon Power Systems: Develop the understanding to design and influence future power systems through the transition of the electricity grid.

## 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

*"The Electrical Engineering Systems major developed my problem-solving skills and my ability to adapt and learn new things quickly. My undergraduate degree was a great experience and opened my eyes to the impact I could have as an engineer."*

**Aditya Ghandi**
Electrical Engineering Systems major
Master of Electrical Engineering

## Sample course plan

### Step 1: Study Electrical Engineering Systems

Bachelor of Science (Electrical Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Today's Science, Tomorrow's World | Calculus 2 | Physics 1 | Engineering Technology and Society |
| | Semester 2 | Engineering Modelling and Design | Linear Algebra | Physics 2: Physical Science and Technology | Breadth |
| Year 2 | Semester 1 | Introduction to Numerical Computation | Engineering Mathematics | Digital Systems | Breadth |
| | Semester 2 | Foundations of Electrical Networks | Science Elective | Science Elective | Breadth |
| Year 3 | Semester 1 | Signals and Systems | Electrical Network Analysis and Design | Science Elective | Breadth / Science Elective |
| | Semester 2 | Electrical Device Modelling | Electronic System Implementation | Science Elective | Breadth / Science Elective |

**Core subjects** **Elective subjects** **Breadth subjects** **Recommended 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.

### Step 2: 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 System Design | Creating Innovative Engineering |
| Year 2 | Semester 1 | Electrical Engineering Capstone Project | Microprocessor Design Clinic | Advanced Communication Systems | Lightwave Systems |
| | Semester 2 | | High Speed Electronics | Introduction to Optimisation | Large Data Methods & Applications |

**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.

### Step 3: Enter into employment with professional accreditation

# 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 global challenges we face in water shortages, climate change and environmental and waste management.

## What is environmental engineering?

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

## What should I study?

Start with an undergraduate degree with a major in Environmental Engineering Systems (3 years full-time), then progress to a Master of Environmental Engineering (2-3 years full-time). This major is available in the following undergraduate degree:

- Bachelor of Science

## Your career

You could work as an environmental engineer in industries such as conservation, renewable energy, mining, sustainability programs, waste management and water resources. Our engineering graduates are working in organisations such as Alluvium Consulting, Bureau of Meteorology, Jacobs, Melbourne Water and Woodside Energy.

## Student experience

As an environmental engineering student, you'll have access to internships and engage with consultants who work on projects around the world, including in China, Vietnam, Thailand, Nepal, Sri Lanka and India. You'll also have the flexibility to choose your environmental engineering focus – developing expertise in energy, water resources or earth observation systems.

## Optional specialisations

- Earth Observation: Study the imaging and analysis systems used to create sustainable landscapes and agriculture.
- Energy Systems: Explore energy efficiency and renewables to ensure low or zero carbon emissions.
- Water Systems: Study the systems that underpin the sustainable development of water systems.

## Research examples

Some examples of the work our researchers are doing include:

- Water sustainability with changing climate
- Ensuring healthy river ecosystems
- Making buildings healthy for people
- Sustainable energy
- Protecting streams from pollution
- Turning any water into drinking water

*"No two days are the same. You could be out in the field taking water samples, on campus building a raingarden or in the lab devising sustainable solutions to solve some of the world's most pressing environmental problems."*

**Nav De Silva**

Environmental Engineering Systems major

Master of Environmental Engineering

## Sample course plan

### Step 1: Study Environmental Engineering Systems

Bachelor of Science (Environmental Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Biology: Life's Machinery | Calculus 2 | Physics 1 | Today's Science, Tomorrow's World |
| | Semester 2 | Engineering Modelling and Design | Linear Algebra | Genetics and the Evolution of Life | Breadth |
| Year 2 | Semester 1 | Analysis of Biological Data | Sustainable Infrastructure Engineering | Foundations of Computing | Breadth |
| | Semester 2 | Earth Processes for Engineering | Engineering Mathematics | Science Elective | Breadth |
| Year 3 | Semester 1 | Fluid Mechanics | Intro to Sustainable Water Management | Science Elective | Breadth / Science Elective |
| | Semester 2 | Environmental Engineering Systems Capstone | Environmental System Modelling and Design | Science Elective | Breadth / Science Elective |

**Core subjects** **Elective subjects** **Breadth subjects** **Recommended 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.

### Step 2: Master of Environmental Engineering

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Quantitative Environmental Modelling | Civil Hydraulics | Spatial Information Programming | 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** **Selective 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.

### Step 3: Enter into employment with professional accreditation

# Industrial Engineering

Scan to learn more

With a degree in industrial engineering, you'll gain skills to improve processes, services and systems. Develop a comprehensive skill set in manufacturing technologies, systems and simulation, operations techniques, sustainability, and digital transformation, along with business management.

## What is industrial engineering?

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

## What should I study?

Start with an undergraduate degree in any Engineering Systems major (3 years full-time), then progress to a Master of Industrial Engineering (2 years full-time).

## Your career

Industrial engineers could work in various industries from manufacturing and processing, to healthcare, banking and consulting. You'll be able to build a career that focuses on doing things better, and you'll have access to work-integrated learning projects and industrial grounding activities while you study so you can get relevant work experience or find a potential mentor.

## Research examples

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

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

## Sample course plan

### Step 1: Study any Engineering major in your undergraduate degree

Bachelor of Science (Mechanical Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Engineering Technology and Society | Calculus 2 | Physics 1 | Today's Science, Tomorrow's World |
| | Semester 2 | Engineering Modelling and Design | Linear Algebra | Physics 2: Physical Science and Technology | Breadth |
| Year 2 | Semester 1 | Numerical Methods in Engineering | Engineering Mechanics | Science Elective | Breadth |
| | Semester 2 | Foundations of Electrical Networks | Engineering Mathematics | Science Elective | Breadth |
| Year 3 | Semester 1 | Thermodynamics and Fluid Mechanics | Mechanics and Materials | Science Elective | Breadth / Science Elective |
| | Semester 2 | Systems Modelling and Analysis | Mechanical Systems Design | Science Elective | Breadth / Science Elective |

Core subjects Elective subjects Breadth 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.

### Step 2: Master of Industrial Engineering

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Industrial Engineering | Design and Manufacturing Practice | Manufacturing Processes and Technology | Creating Innovative 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 Selective 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.

### Step 3: Enter into employment with professional accreditation

*"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

# Information Technology and Software Engineering

Scan to learn more

Transform the future of business, health and entertainment. Use your knowledge in programming, artificial intelligence and cloud computing to create and manage software systems, from niche mobile apps to large enterprise systems. You might find ways to use technology to improve business processes or discover new technology advances.

## Information Technology, Software Engineering and Computer Science

You can incorporate technology into your undergraduate studies and have opportunities for graduate study for advanced tech skills, business analysis, software engineering or computer science.

Choose from majors in either the Bachelor of Design or the Bachelor of Science.

## What is information technology and software engineering?

Transform the future of business, health and entertainment. Use your knowledge in programming, artificial intelligence and cloud computing to create and manage software systems, from niche mobile apps to large enterprise systems. You might find ways to use technology to improve business processes or discover new technology advances.

To study information technology or software engineering, you can choose to study a Bachelor of Design or a Bachelor of Science.

## Computing and Software Systems major

From apps, gaming, productivity software, financial products to web development, this major will build the knowledge and skills you need for a career in the software industry. Use programming languages, learn about the systematic processes behind the software development life cycle, and gain an appreciation of advanced computing. Once completed, you can level up your major with graduate study to become an accredited software engineer.

You can study this major in either the Bachelor of Design, or the Bachelor of Science. The major is the same in both courses, but you can explore different subject options outside of your major to keep your study options open, combine skills with different electives.

## User Experience Design major

Gain practical skills and knowledge in the fundamentals of digital technology, focusing on algorithmic, data-oriented and web-based techniques. You'll build an understanding of how these techniques can be applied to digital design formats, including web-based media, mobile media and interactive technologies.

The User Experience Design major is available in the Bachelor of Design.

## Data Science major

Develop a strong foundation in the statistical aspects of data science, including data collection, data mining, modelling and inference. Using the principles of computer science, you'll gain a strong understanding of algorithms, data structures, data management and machine learning. You'll use these tools to measure how data is changing industries and how you can analyse data to understand modern life.

The Data Science major is available in the Bachelor of Science.

## How to become an information technology professional

### Step 1 Choose your undergraduate degree

Bachelor of Science:

- Computing and Software Systems
- Data Science
- Digital Infrastructure Engineering
- Mechatronics Engineering

Bachelor of Design

- Computing and Software Systems
- Digital Infrastructure Engineering
- User Experience Design

Bachelor of Commerce

- Use breadth to complete at least one first-year programming subject

### Step 2 Complete graduate study

- Master of Computer Science❶
- Master of Data Science
- Master of Information Systems
- Master of Information Technology
- Master of Software Engineering

### Step 3

Explore your career options in data science, business analytics, consulting, software engineering and more.

❶ Only students who have completed the Computing and Software Systems major will be eligible for this course.

# Information Technology

Scan to learn more

Computers are central to everything we do as data becomes more important for decision making and technology becomes more powerful. You can be a part of finding new ways to use tech or building the new tech that could change the way we work.

## What should I study?

Information technology at Melbourne is flexible - you can study information technology through your bachelor degree as a major or specialise further and receive professional accreditation with a masters. Undergraduate majors are available through:

- Bachelor of Design
- Bachelor of Science
- Bachelor of Commerce

You can then progress to graduate study with options to pursue technical expertise, business analytics skills, research and more.

## Your career

Build a career as an app developer, data analyst, digital copywriter, games developer, information technology consultant, data scientist and more. If you focus on the information technology, you can build the technical skills that help us understand and develop new technologies.

## Student experience

Engage with technologies such as virtual and augmented reality, computer games and build skills in 2D and 3D computer graphics, usability, accessibility and more.

## Available specialisations

- **Artificial Intelligence:** Design, implement and analyse machines that learn, plan and reason covering topics like machine learning and digital ethics.
- **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.
- **Cybersecurity:** Create new technologies to improve security covering topics like cryptography and security analytics.
- **Digital Innovation:** Discover how to create digital innovative solutions using advanced computing expertise and industry-based entrepreneurial practices.
- **Distributed Computing:** Manage large quantities of data through networks and cover topics like distributed algorithms and parallel computing.
- **Human-Computer Interaction:** Create the next generation of interfaces with knowledge in user experience and social computing.

## Research examples

Our Information Technology graduates are conducting research on issues such as:

- Ageing in a virtual world
- Insertable technology
- Digital connectivity, crime and privacy
- Greener cloud computing

*"This degree provides the opportunity for those without an IT background to gain IT skills. This allows you to enter the workforce with a hybrid educational background to bridge the knowledge gap between IT and non-IT departments in companies."*

**Lee Guo Yi**

Master of Information Technology graduate

Human-Computer Interaction Lab

## Sample course plan

### Step 1: Study any Science major in your undergraduate degree

Bachelor of Science (Computing and Software Systems major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Foundations of computing | Calculus 1 | Science elective | Today's Science, Tomorrow's World |
| | Semester 2 | Foundations of Algorithms | Calculus 2 | Science Elective | Breadth |
| Year 2 | Semester 1 | Design of Algorithms | Science Elective | Science Elective | Breadth |
| | Semester 2 | Object Oriented Software Development | Database Systems | Science Elective | Breadth |
| Year 3 | Semester 1 | Software Modelling and Design | Computer Systems | Science Elective | Breadth/Science Elective |
| | Semester 2 | Information Technology Project | Models of Computation | Science Elective | Breadth/Science Elective |

**Core subjects** **Elective subjects** **Breadth 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.

### Step 2: Master of Information Technology (Cybersecurity specialisation)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Distributed Systems | Software Processes and Management | Introduction to Machine Learning | Elective |
| | Semester 2 | Cryptography and Security | Security and Software Testing | Web Security | Security Analytics |
| Year 2 | Semester 1 | High Integrity Systems Engineering | Elective | Computing 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.

### Step 3: Enter into employment with professional accreditation

# Information Systems

Scan to learn more

**Support businesses to use and benefit from technology. This could mean integrating cloud computing, creating cybersecurity networks or interpreting data to help a business make the best decisions.**

You can combine technology and business skills in multiple undergraduate study areas for either your major, breadth or electives. This gives you opportunities to study Science, Design or Commerce or more depending on your interests and skills.

A Computing and Software Systems major could be combined with business electives to give you an overview of the potential tech can have in shaping how companies work. Or a User Experience Design major can help you focus on what people want and how they use different kinds of technology.

All of this can lead to graduate study such as the Master of Information Systems where you'll blend technological and organisational skills to transform how we work.

## Your career

With information systems, you'll connect the technological potential of software with the business problems that need solving, or processes that need improving. This means you could work in any industry that uses, or could benefit from, using technology.

This could mean a career in process design, consulting or project management. Combine your knowledge in data science, data visualisation and computing to improve how we use technology.

## Optional specialisations

- Research: If you're interested in a research career, you could take on a specialisation in research to conduct an original investigation with a major research project. You can apply for this specialisation after your first semester.

## Sample course plan

### Step 1: Study any Design major in your undergraduate degree

Bachelor of Design (Computing and Software Systems major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Media Computation | Calculus 1 | Design elective | Breadth |
| | Semester 2 | Foundations of Algorithms | Calculus 2 | Design elective | Breadth |
| Year 2 | Semester 1 | Design of Algorithms | Elements of Data Processing Design | Design elective | Breadth |
| | Semester 2 | Database Systems | Design elective | Design elective | Breadth |
| Year 3 | Semester 1 | Advanced Interface Prototyping | Computer Systems | Design elective | Breadth/Design Elective |
| | Semester 2 | Information Technology Project | Graphics and Interaction | Design elective | Breadth/Design Elective |

**Core subjects** **Elective subjects** **Breadth 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.

### Step 2: 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 | Cybersecurity 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**

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.

### Step 3: Enter into employment with professional accreditation

# Software Engineering

Scan to learn more

You'll use engineering principles to build software products. This could be developing computer games or running a communications control system. Throughout your subjects you'll build your programming skills in different programming languages and your graduate study will help you become an accredited engineer.

## What should I study?

Start with an undergraduate degree with a major like Computing and Software Systems (3 years full-time), then progress to a Master of Software Engineering (2-3 years full-time). This major is available in the following undergraduate degrees:

- Bachelor of Design
- Bachelor of Science

## Your career

As a software engineer, you could work in banking and finance, human-computer interaction, technology consulting, health and more.

## Optional specialisations

- Artificial intelligence
- Business
- Cybersecurity
- Distributed computing
- Human-computer interaction

*"Some of the skills I've learned include how to do better research, how to figure out which tools are appropriate for the job, and how to think more critically."*

**Sebastian Chara**
Master of Software Engineering student

## Sample course plan

### Step 1: Master of Software Engineering

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Software Processes and Management | Software Requirements and Analysis | Creating Innovative Engineering | Elective |
| | Semester 2 | Security & Software Testing | Masters Software Engineering Project | Elective | Elective |
| Year 2 | Semester 1 | Master Advanced Software Project part 1 | Software Design and Architecture | Modelling Complex Software Systems | Elective |
| | Semester 2 | Master Advanced Software Project part 2 | High Integrity Systems Engineering | 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.

### Step 2: Enter into employment with professional accreditation

# Computer Science

Scan to learn more

Computer science combines technical elements from information technology, analytical skills from information systems and through graduate study, gives you the option to pursue a research career.

## What should I study?

Start with an undergraduate degree with a major like Computing and Software Systems, User Experience Design or Data Science (3 years full-time), then progress to a Master of Computer Science (2 years full-time). This major is available in the following undergraduate degrees:

- Bachelor of Design
- Bachelor of Science

## 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 Victoria's 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 people in many 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.

## Sample course plan

### Master of Computer Science

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Introduction to Machine Learning | AI Planning for Autonomy | Declarative Programming | Cluster and Cloud Computing |
| | Semester 2 | Research Methods | Statistical Machine Learning | Computer Vision | Machine Learning Applications for Health |
| Year 2 | Semester 1 | Computer Science Research Project Part 1 | | Computer Science Research Project Part 2 | |
| | Semester 2 | Computer Science Research Project Part 3 | | Computer Science Research Project Part 4 | |

**Core subjects** **Elective subjects** **Breadth 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.

*"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

# Mechanical Engineering

Scan to learn more

Design and build tomorrow's machines and systems, from small scale devices to airplanes and spacecraft. Turn energy into power and motion, gaining skills in mechanical design, manufacturing, thermodynamics, fluid mechanics and more.

## What is mechanical engineering?

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

## What should I study?

Start with an undergraduate degree with a major in Mechanical Engineering Systems (3 years full-time), then progress to a Master of Mechanical Engineering (2-3 years full-time). This major is available in the following undergraduate degrees:

- Bachelor of Design
- Bachelor of Science

## Your career

As a Melbourne graduate, you'll be equipped to work as a mechanical engineer in industries such as aerospace, biomechanics, manufacturing, healthcare, weather and climate prediction, minerals, energy, robotics, transport and more.

Our mechanical engineering graduates are working in companies such as Arup, CSIRO, BHP, Mars Australia, Telstra and Yarra Trams.

## Optional specialisations

- Aerospace: Develop advanced skills in fluid mechanics, propulsion, aeroelasticity and aerospace control.
- Business: Study tailored subjects covering economics, marketing and finance.
- Manufacturing: Design and manufacture machine elements, including concurrent design of systems and productions and computer-based manufacturing.
- Materials: Become an expert in materials processing, metals for additive manufacturing, material modelling and characterisation, and how to make high- performance materials.

*"I learned about thermodynamics, fluid dynamics, mechanics, electrical engineering, and mathematics. Now that I've graduated, I can explore one of many pathways in mechanical engineering."*

**Vinuri Sonara Peiris**

Mechanical Engineering Systems major, Master of Mechanical Engineering

## Sample course plan

### Step 1: Study Mechanical Engineering Systems

Bachelor of Science (Mechanical Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Engineering Technology and Society | Calculus 2 | Physics 1 | Today's Science, Tomorrow's World |
| | Semester 2 | Engineering Modelling and Design | Linear Algebra | Physics 2: Physical Science and Technology | Breadth |
| Year 2 | Semester 1 | Numerical Methods in Engineering | Engineering Mechanics | Science Elective | Breadth |
| | Semester 2 | Foundations of Electrical Networks | Engineering Mathematics | Science Elective | Breadth |
| Year 3 | Semester 1 | Thermodynamics and Fluid Mechanics | Mechanics and Materials | Science Elective | Breadth / Science Elective |
| | Semester 2 | Systems Modelling and Analysis | Mechanical Systems Design | Science Elective | Breadth / Science Elective |

**Core subjects** **Elective subjects** **Breadth 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.

### OR

Bachelor of Design (Mechanical Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Calculus 1 | Physics 1 | Design Elective | Breadth |
| | Semester 2 | Calculus 2 | Physics 2 | Linear Algebra | Breadth |
| Year 2 | Semester 1 | Numerical Methods in Engineering | Design Elective | Design Elective | Breadth |
| | Semester 2 | Foundation of Electrical Networks | Engineering Mathematics | Engineering Mechanics | Breadth |
| Year 3 | Semester 1 | Thermodynamics and Fluid Mechanics | Mechanics and Materials | Design Elective | Breadth / Design Elective |
| | Semester 2 | Systems Modelling and Analysis | Mechanical Systems Design | Design Elective | Breadth / Design Elective |

**Core subjects** **Elective subjects** **Breadth 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.

### Step 2: Master of Mechanical Engineering (Aerospace specialisation)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Thermodynamics | Dynamics | Materials | Design and Manufacturing Practice |
| | Semester 2 | Fluid Dynamics | Solid Mechanics | Control Systems | Creating Innovative Engineering |
| Year 2 | Semester 1 | Capstone Project | Advanced Fluid Dynamics | Aerospace Dynamics and Control | Computational Fluid Dynamics |
| | Semester 2 | | Vibrations and Aeroelasticity | Aerospace Propulsion | Advanced Materials |

**Core subjects** **Elective 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.

### Step 3: Enter into employment with professional accreditation

# Mechatronics Engineering

Scan to learn more

Want a career where you control robots? Mechatronics is a blend of mechanical, electrical and software engineering, and the key to a 'smart' and connected future.

## What is mechatronics engineering?

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

## What should I study?

Start with an undergraduate degree with a major in Mechatronics Engineering Systems (3 years full-time), then progress to a Master of Mechatronics Engineering (2-3 years full-time). This major is available in the following undergraduate degree:

- Bachelor of Science

## Your career

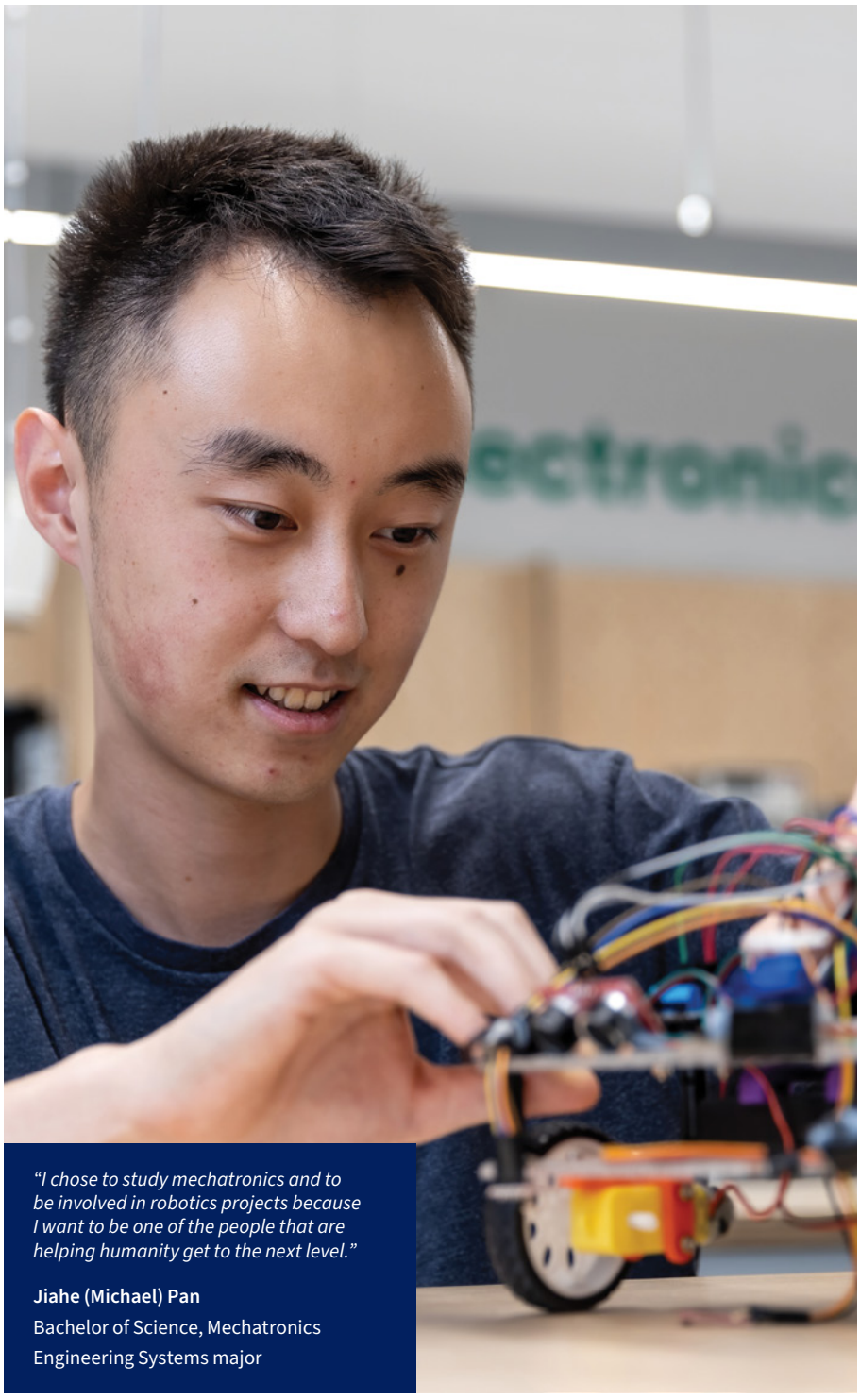
You could work as a mechatronics engineer in industries such as aerospace, advanced manufacturing, computing and electronics, mining and robotics. Our engineering graduates work in organisations such as IBM, Telstra, Ford, KPMG and Alerte Digital Health.

## Student experience

As a mechatronics engineering student, you'll have access to internships, use high level programming languages and benefit from world-class facilities, such as rehab robots, drone platforms and large-scale water management systems.

## Optional specialisation

- Manufacturing: Leverage your mechatronics skills to create innovative products and services for the flexible modern economy, with a strong grounding in physical manufacturing systems.



*"I chose to study mechatronics and to be involved in robotics projects because I want to be one of the people that are helping humanity get to the next level."*

**Jiahe (Michael) Pan**
Bachelor of Science, Mechatronics Engineering Systems major

## Sample course plan

### Step 1: Study Mechatronics Engineering Systems

Bachelor of Science (Mechatronics Engineering Systems Major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Engineering Technology and Society | Calculus 2 | Physics 1 | Today's Science, Tomorrow's World |
| | Semester 2 | Engineering Modelling and Design | Linear Algebra | Physics 2: Physical Science and Technology | Breadth / Science Elective |
| Year 2 | Semester 1 | Numerical Methods in Engineering | Engineering Mathematics | Science Elective | Breadth |
| | Semester 2 | Foundations of Electrical Networks | Engineering Mechanics | Science Elective | Breadth |
| Year 3 | Semester 1 | Analog and Digital Electronics Concepts | Science Elective | Science Elective | Breadth / Science Elective |
| | Semester 2 | Mechanical Systems Design | Systems Modelling and Analysis | Numerical Programming for Engineers | Breadth |

**Core subjects** **Elective subjects** **Breadth 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.

### Step 2: 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 | Robotics Systems | Artificial Intelligence for Engineers | Aerospace Dynamics and Control | Capstone Project |
| | Semester 2 | Advanced Control Systems | Advanced Dynamics | Manufacturing Automation and IT | |

**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.

### Step 3: Enter into employment with professional accreditation

# Majors, minors and specialisations

**Scan to learn more**

## What is a major?

A major is a focused set of subjects that provides specialised knowledge in a particular field of study. Most undergraduate courses require the completion of at least one major.

## What is a minor?

A minor is a shortened sequence of subjects taken from a major that allows you to explore another field of interest in addition to your main area of study.

## 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 your 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.

To complete a specialisation, you'll need to complete specific subjects to qualify. These subjects build on the expertise you'll develop throughout your degree and can demonstrate to potential employers that you're an expert in a specific field. You don't need to apply for a specialisation, but some subjects may have prerequisites.

Example: Master of Electrical Engineering, Autonomous Systems specialisation

Autonomous systems accomplish tasks with minimum human involvement, with common examples including vehicles, drones and smart buildings. All of these systems rely on sensing, control and signal processing, computing and mathematics – all topics that you will cover in depth during an Autonomous Systems specialisation in a Master of Electrical Engineering. A selection of the core subjects in this specialisation includes:

Advanced Control Systems where you will learn how to design and develop model-based controllers that can meet high performance specifications in systems.

Advanced Signal processing where you will learn how to apply algorithms that extract the useful parts from otherwise noisy signals to ensure your autonomous system is acting on the best available information.

Embedded systems where you will be introduced to the modelling, analysis, and design of microprocessor-based embedded systems that are essential in standalone autonomous applications.

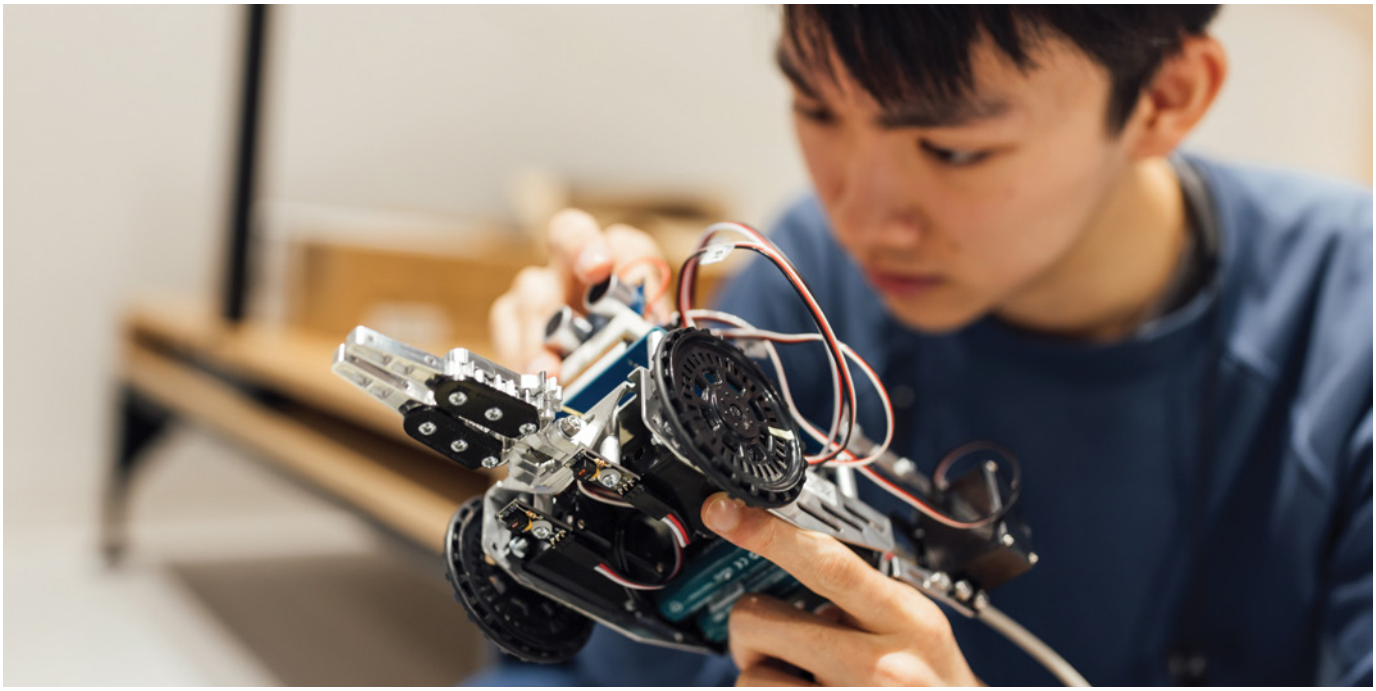
Autonomous Systems Clinic will integrate skills from across these subdisciplines as you to design and build an autonomous system through hands-on experience, implementation, and verification.

All of this will come together in your Capstone project where you have the opportunity to work on your choice of an industry or research project involving a range of modelling, analysis and development activities related to autonomous systems.

## Where can this specialisation take me?

There are autonomous systems operating in virtually all industries and many of our daily lives, and all those applications require your specialist knowledge. 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 systems to reduce water loss from irrigation helping to improve the health of our waterways and make farming more sustainable.

* **Futurumcareers.com**, How are control engineers improving the sustainability of irrigated agriculture.



# Student experience

Scan to learn more

At Melbourne, engineering and information technology offer more than just classroom learning. Engage in a variety of clubs and societies, engage with industry experts and enjoy the vibrant surroundings of one of the world's most exciting cities.

## 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. 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
- ENG & IT Community
- Robogals
- Unimelb Rover Team
- Women in Science and Engineering (WISE)
- Women in Technology

## Melbourne Accelerator Program

Get your startup off the ground. Apply for the Melbourne Accelerator Program (MAP), a unique startup incubator that gives students the opportunity to forge their careers as entrepreneurs with the support of fellowship grants, office spaces and access to a network of mentors and investors.

## Study abroad and exchange

Combine travel and study by taking part of your degree overseas through approved programs worldwide. With 200 university exchange partners and various engineering and information technology partnerships, such as AOTULE and GE3 networks, you'll have numerous opportunities to study at top schools across Asia, Oceania, Europe, and the US.

Scholarships and funding options are available for short-term or semester-long programs, making it possible to explore different countries during your degree.

## Advising and mentoring

From your second undergraduate semester onwards, you'll have meetings with an academic from within your faculty. Your academic adviser will be with you at regular checkpoints throughout your degree to provide advice, identify areas of personal interest to explore, and help you in your university journey. Throughout your studies, you'll also be able to explore career and graduate study options with alumni and industry mentors.

## Melbourne Peer Mentor Program

In your first semester of undergraduate studies, you'll be matched with a Peer Mentor from your faculty as part of a small group of students. Hear from fellow students, ask about navigating uni life, and make friends with other people in your degree. You can then develop your leadership and interpersonal skills in your second year onwards by signing up to become a Peer Mentor yourself!

## Melbourne Plus

Melbourne Plus rewards your growth and development with certified digital credentials that you can earn outside the classroom through a wide range of volunteer and paid activities. You'll build capabilities with transferable skills and be able to share these credentials with your networks and future employers.

*"I'm in the propulsion sub-team of the ARES rocketry team. We're looking at building a hybrid rocket motor. If we can do enough research and development within the next year or so, we can take a hybrid rocket motor to Spaceport in the US."*

**Tully Mahr**

Master of Mechanical Engineering student

# Endeavour Exhibition

**Scan to learn more**

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

Throughout your engineering studies, you'll have opportunities to put what you're learning in the classroom into action for real projects. In your postgraduate degree, you can take part in work-integrated learning to put your skills into practice.

When you get to the graduate study level, you can take part in the Endeavour Exhibition, where you can 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 in choosing 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 and have the opportunity to get involved in a student photoshoot or document your experience with the Road to Endeavour.

*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 and used human-centred design principles to create an attachment for a motorised bike that will help with labor in agricultural settings in the Pursat region of Cambodia.*

*Addressing issues with labor 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.**

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

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.

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

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.

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

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

*Jack and Andria are Bachelor of Science students both majoring in Mechanical Engineering Systems and they're working on an interactive pet lizard that can detect objects in its path to find the way through a maze.*

# Industry experiences and careers

Scan to learn more

**Connect with industry partners, research groups, start-ups and more to gain relevant experience while you study. You could complete an industry project, take on an internship or work on an innovation challenge with an industry mentor.**

Some of your subjects may feature guest lecturers who will bring the latest knowledge and work from the industry to show you how you can apply what you learn in the workplace, or you could connect with an alumni mentor to help you figure out where your career could take you.

## Internships

Internships provide you with opportunities to gain hands-on work experience to apply the knowledge and skills you've developed in your studies. You can complete internships during both your undergraduate study and your masters study, with options to complete internships as part of a subject for credit, or you can source them on your own.

- Undertake professional-level work experience and gain credit towards your degree.
- Take part in workshops run by qualified careers counsellors to improve your resume, develop your interview skills and build your employability for the future.
- Explore international and domestic internship opportunities related to your discipline and career goals.

As an undergraduate student, you can take engineering related internships through the Bachelor of Science work-integrated learning subjects or the Bachelor of Design vocational placements. The University also offers work opportunities through the Students@Work program where you could find a job on campus.

As a masters student, you could complete an internship as part of a subject for credit towards your degree or undertake paid work in industry outside of your studies with a not-for-credit internship. With both domestic and international internships available and the option to apply for positions with our industry contacts or find your own, an internship is the perfect opportunity to build your experience, employability and kick start your career before you graduate.

## Industry projects

- Undertake a design or research project with industry and apply your knowledge to a real-world problem.
- Undertake your project over the course of a semester, full year or summer break.
- Develop a collaborative relationship with those working in industry.

## Industry-connected curriculum

- Creating Innovative Engineering: Take an innovation challenge with an industry mentor in this first-year Master of Engineering subject.
- Professional IS Consulting: A practice-oriented subject in the Master of Information Systems, which helps you build working relationships with clients.
- Steel Week: Work with an industry practitioner on a structural engineering project and gain insight into engineering consulting in the Master of Civil Engineering.
- BioDesign Innovation: Collaborate with Master of Business Administration students to design a marketable medical device as part of the Master of Biomedical Engineering.

## STEM Mentoring

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

## Other opportunities

- Industry panels and guest lectures
- Networking events
- Site visits
- Hackathons
- Health and wellbeing events
- Events and information sessions to enhance your professional skills

# Engineering for high school students

Scan to learn more

Eager to try out engineering or programming before you start uni? We offer a range of hands-on activities and workshops for high school students throughout the year.

## Work Experience Week

### Designed for: Year 10s

Want to know what it's like to be a scientist? Participate in workshops and activities in a STEM discipline of your choice. Meet new friends and role models and get a taste of university life.

## Girls' Programming Network

### Designed for: High school girls

Take part in a series of workshops each term, developed and run by girls for girls. You will learn to program using Python and improve your software development skills.

## Hands on Engineering & Information Technology

### Designed for: Year 10s

Take part in interactive, hands-on activities to learn about engineering and technology concepts and issues.

Available in school holidays and as a school excursion.

## Girl Power

### Designed for: Years 9-12 (program starts in year 9)

Learn about careers in engineering and information technology and connect with like-minded high school students. Girl Power is a four-year program, where you'll join us for a three-day camp at the University of Melbourne, undertake work experience and participate in a mentoring program.

# Your study options

Scan to learn more

## Bachelor of Biomedicine, Design, or Science

To be eligible for the two-year Master of Engineering, choose an engineering major in the Bachelor of Biomedicine, Design or Science. As a Melbourne graduate, you'll be guaranteed a CSP* or international fee place into the Master of Engineering if you achieve a Weighted Average Mark (WAM) of 65% or higher in your bachelors degree.

## Graduate Degree Package

Enrol into both a University of Melbourne bachelors degree and Master of Engineering or Information Technology (IT) degree through VTAC. Graduate Degree Packages into the Master of Engineering or IT are available through the through the Bachelor of Biomedicine for students who achieve a 95.00 ATAR or above or through the Bachelors of Commerce, Design or Science for students who achieve a 93.00 ATAR or above. This option guarantees your Commonwealth Supported Place* (CSP) or International fee place in the Master of Engineering or IT. A Graduate Degree Package has its own course code, so if you're not sure what ATAR to expect or want to keep your choices open, you can still enrol in the individual undergraduate degree - just indicate it as a separate preference in VTAC.

## Bachelor of Commerce

This pathway is ideal if you're looking to combine business skills like management, finance or accounting with technical knowledge in engineering or information technology to lead into a broad range of career options in engineering, information technology, business or consultancy.

High-achieving students can enrol in the Bachelor of Commerce/Master of Engineering or IT Graduate Degree Package (GDP). You will be guaranteed a Commonwealth Supported Place or international fee place into the three-year Master of Engineering or IT, provided you meet the maths and science entry requirements.

Bachelor of Commerce students who intend to progress to the Master of Engineering will be permitted to complete the four prerequisite first year subjects using breadth.

## Any bachelor degree

If you study any University of Melbourne undergraduate degree without an engineering major you are still guaranteed a CSP or international fee place in the Master of Engineering, Master of Information Technology or Master of Information Systems provided you achieve a WAM of 65% or higher in your bachelors degree, and meet the prerequisite requirements.

If you follow this path, you'll be eligible for the three-year Master of Engineering or the two-year Master of Information Technology or Master of Information Systems.

## Melbourne Chancellor's Scholarship

The Melbourne Chancellor's Scholarship guarantees high-achieving students entry into the Master of Engineering. It is available to students who complete Year 12 or the International Baccalaureate (IB) in Australia and who achieve an ATAR of 99.90 or higher.

## Sample course plan

### Step 1: Study Mechanical Systems

Bachelor of Commerce (Finance major)

| | | | | | |
|---|---|---|---|---|---|
| Year 1 | Semester 1 | Introductory Microeconomics | Accounting Reports and Analysis | Quantitative Methods 1 | Calculus 2 |
| | Semester 2 | Introductory Macroeconomics | Principles of Finance | Linear Algebra | Physics 1 |
| Year 2 | Semester 1 | Organisational Behavior | Intermediate Microeconomics | Corporate Financial Decision Making | Commerce Elective |
| | Semester 2 | Intermediate Macroeconomics | Introductory Personal Finance | Breadth* | Econometrics 1 |
| Year 3 | Semester 1 | Microeconomics | Breadth / Commerce Elective | Investments | Entrepreneurial Finance |
| | Semester 2 | Macroeconomics | Derivative Securities` | Econometrics 2 | Breadth / Commerce Elective |
| | Summer semester | Physics 2: Physical Science and Technology | | | |

**Core subjects** **Economics subjects** **Finance subjects** **Breadth subjects** **Community Access Program subject**

Learn more at **https://eng.unimelb.edu.au/students/preeng-it/commerce-pathway**.

* BCom students must complete four prerequisite subjects to meet entry requirements for the three-year Master of Engineering: two specified maths subjects and two first year science subjects (relevant to your chosen engineering stream). Normally BCom students can complete a maximum of three level-1 breadth subjects, however students who intend to progress to the Master of Engineering can complete four level-1 breadth subjects to meet entry requirements for the Master of Engineering.

❶ This is a sample course plan only. Subjects offered may change from year to year. You will be advised of current subject offerings prior to subject selection and enrolment.

❷ A combination of economics and econometrics subjects is required to be awarded the Economics major. For full details, please see the University Handbook. The selected major subjects at level 3 are required for entry into honours in economics.

# How to apply and entry requirements

Scan to learn more

## How to apply

### Domestic students

Domestic students applying for an undergraduate course must submit an application through the Victorian Tertiary Admissions Centre (VTAC). Domestic students studying overseas must also apply through VTAC.

To receive Access Melbourne consideration, you must lodge a Special Entry Access Scheme (SEAS) application via VTAC.

**vtac.edu.au**

### International students

International students studying an Australian Year 12 or IB in Australia must apply through VTAC.

All other international students, including those undertaking foundation studies in Australia, must apply directly to the University or through one of our overseas representatives.

## Non-school leaver entry pathway

We understand that not all students come directly from completing an Australian Year 12 qualification. The non-school leaver entry pathway provides an alternative way to demonstrate your eligibility for entry and your likelihood to succeed in your chosen course.

go.unimelb.edu.au/z38e

## Guaranteed entry

If you complete your undergraduate degree at the University of Melbourne and achieve a Weighted Average Mark (WAM) of 65%, you are guaranteed a Commonwealth Supported Place (domestic students) or an international fee place (international students), for the Master of Engineering, Master of Information Systems or Master of Information Technology, regardless of your ATAR[1].

## Commonwealth Supported Places (CSP)

Domestic students and the Australian Commonwealth Government share the cost of tuition. Student contribution is based on the subjects you enrol in, rather than the overall course.

**studyassist.gov.au**

## Fees

Visit our website for more information on Domestic (CSP) and International student fees.

**go.unimelb.edu.au/djy6**

Check out the Australian Government's website for current CSP contributions.

**go.unimelb.edu.au/gn36**

## HECS-Help

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

**studyassist.gov.au**

[1] Provided the maths and science entry requirements are met.

[2] Fees are based on Equivalent Full-Time Student Load (EFTSL): 1 EFTSL is a standard annual full-time load.

# Entry requirements

**Scan to learn more**

| Qualification | Bachelor of Biomedicine | Bachelor of Design | Bachelor of Science | Bachelor of Commerce |
|---|---|---|---|---|
| **Australian Year 12** | | | | |
| **Graduate degree package** | 95.00 | 93.00 | 93.00 | 93.00 |
| **Domestic guaranteed ATAR 2024 / Lowest selection rank 2024**[1] | 95.00 / 92.00 | 88.00 / 85.10 | 88.00 / 87.00 | 93.00 / 92.00 |
| **International guaranteed ATAR 2024** | 95.00 | 85.00 | 85.00 | 92.00 |
| **Prerequisites**[2] | A study score of at least 25 in English/English Language/Literature or at least 30 in EAL<br>AND<br>At least 25 in Chemistry and in Mathematical Methods or Specialist Mathematics | A study score of at least 25 in English/English Language/Literature or at least 30 in EAL<br>If intending to pursue an engineering systems or computing major: At least 25 in Mathematical Methods; OR undertake a bridging mathematics subject as breadth in first year | A study score of at least 25 in English/English Language/Literature or at least 30 in EAL<br>AND<br>At least 25 in Mathematical Methods or Specialist Mathematics, and<br>in one of Biology, Chemistry or Physics; OR<br>At least 25 in both Mathematical Methods and Specialist Mathematics | A study score of at least 25 in English/English Language/Literature or at least 30 in EAL<br>AND<br>At least 25 in Mathematical Methods or Specialist Mathematics |
| **International Baccalaureate (IB)** | | | | |
| **Diploma International students: 2024 guaranteed score** | 37 | 31 | 31 | 35 |
| **IB Prerequisite subjects** | English, Chemistry and Mathematics (or Further Mathematics) | English | English, Mathematics (or Further Mathematics) and one of: Biology, Chemistry or Physics; OR English, Mathematics and Further Mathematics | English and Mathematics (or Further Mathematics) |
| **GCE A Levels/Singapore A Levels** | | | | |
| **International students: 2024 guaranteed score** | AAB | BCC | BCC | ABB |
| **A level prerequisite subjects** | Chemistry, Mathematics and an approved AS Level English subject | An approved AS Level English subject | Mathematics and one of Biology, Chemistry or Physics and an approved AS Level English subject | Mathematics and an approved AS Level English subject |
| **Trinity College Foundation Studies** | | | | |
| **International students: 2024 guaranteed score** | 91 | 80 | 80 | 86 |
| **TCFS prerequisite subjects** | EAP, English, Chemistry and Mathematics 1 | EAP and English | EAP, English, Mathematics 1, and one of: Biology, Chemistry or Physics<br>OR EAP, English and both Mathematics 1 and Mathematics 2 | EAP, English, Mathematics 1 and History of Ideas |

Achieve 65% average to enter the Master of Engineering. Not required for Graduate Degree Packages.

[1] Domestic guaranteed ATARs for 2025 have not yet been set. The 2024 lowest selection rank is the lowest ATAR domestic school-leaver applicants were selected to in January 2024. This rank should be used as a guide only, as it is subject to change in future intakes.

[2] Prerequisite subject requirements are expressed in terms of VCE 3/4 subjects here. If you are not a VCE student, refer to our Study site for prerequisite details specific to your qualification **study.unimelb.edu.au/**

# Scholarships

Scan to learn more

**We offer more than 1200 scholarships and prizes for new and current students.**

Our scholarships range from those awarded on merit, to others that assist with your expenses or to enable you to travel the globe. Some support your whole course or allow you to explore a specific interest.

The many prizes, grants and bursaries we offer help you get the most out of your time at university. These are awarded to continuing students at different points in their studies.

There are prizes for academic achievement, grants to undertake volunteering or leadership activities and bursaries to ease financial pressures so you can focus on your studies.

## Melbourne Chancellor's Scholarship

The Melbourne Chancellor's Scholarship is offered to undergraduate students in recognition of their outstanding academic achievement during their Australian Year 12 or International Baccalaureate (IB).

This is one of the University's most prestigious awards for school leavers and is awarded for academic merit. The scholarship is guaranteed to students who achieved an ATAR of at least 99.90, Indigenous students with an ATAR of at least 90, or students enrolling in the Bachelor of Music with an ATAR of at least 99.85 and an audition score of A+.

As a Chancellor's Scholar, you will enjoy generous fee exemptions and be guaranteed a place in the graduate program of your choice at Melbourne. Domestic students also receive a living allowance for up to three years.

In addition, you will receive a Melbourne Global Scholars Award to help you on your way to studying overseas as an exchange or study abroad student.

Eligible students who apply for admission to the University through VTAC are automatically considered for a Melbourne Chancellor's Scholarship, so you don't need to make a separate application.

## Hansen Scholarship Program

The Hansen Scholarship Program nurtures and significantly expands the horizons of approximately 20 Australian students each year, who may otherwise struggle to access a high-quality university education. Worth up to $108K, this scholarship offers fully funded accommodation at Little Hall for three years, tailored mentoring and extracurricular activities, and focused financial support.

## Narrm Scholarship Program

The Narrm Scholarship is offered to students who have applied under Access Melbourne. No separate application is required.

The scholarship provides an allowance of $6500 per year and a relocation allowance for students from regional and remote areas. Narrm Scholars also have access to an enrichment program to support their success throughout their studies.

The Narrm Scholarship is guaranteed to Indigenous students and students from low socio-economic areas. Students who meet other access categories, for example those with a disability or medical conditions or experiencing difficult personal circumstances will be considered for the scholarship based on overall level of disadvantage.

## Melbourne Relocation Scholarship

The Melbourne Relocation Scholarship is guaranteed to students from regional and remote areas who have applied through Access Melbourne and are not in receipt of another scholarship.

The scholarship provides a relocation allowance of $1500 to assist with the cost of moving to Melbourne.

## National Merit Scholarship

The National Merit Scholarship takes the stress out of relocating from Australian states and territories outside Victoria with an $8000 allowance paid in the first semester of your studies.

## Melbourne International Undergraduate Scholarship

Offers fee remissions for high-achieving international students who have completed secondary school outside Australia, or a foundation program in Australia.

## Humanitarian Access Scholarship

Offering full fee remission and $15,000 in living allowances to talented students, the Humanitarian Access Scholarship is for those who have applied for asylum in Australia.

## Faculty scholarships

Our faculties offer hundreds of specific awards that can help you through your undergraduate studies. For a full list and how to apply, check faculty websites.

## Residential college scholarships

More than one third of college students receive financial assistance, with a combined $7.5M in college scholarships and bursaries available. A scholarship may reduce the fees by between $100–$500 per week. A further $1.6M is for students who are employed part time by their college.

**colleges.unimelb.edu.au/scholarships-and-fees/**

## Elite Athlete Program

If you excel in sport, our Elite Athlete Program offers generous scholarships to help you pursue your sporting dreams as well as your academic aspirations.

**sport.unimelb.edu.au/programs/elite-athlete-program**

## Airwallex Excellence in Technology Scholarship

Established to support exceptional second year undergraduate students majoring in Computing and Software Systems. Each scholarship is valued at $30,000 for a period of two years.

## Paterson Scholarship

This scholarship supports an undergraduate student on an engineering pathway throughout their undergraduate degree and subsequent masters degree.

THE UNIVERSITY OF MELBOURNE

# UniMelb On-Demand

Get to know us better in your own time

The University of Melbourne (Australian University) PRV12150 / CRICOS 00116K



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