ENGINEERING AND IT

Guide for school leavers

For more information, visit eng.unimelb.edu.au
Elizabeth’s goal to contribute to society, together with her love of maths and physics, led her to study engineering at Melbourne.

“I wanted to work in an industry that would allow me to contribute to society in a positive way. With structural engineering, you can make a difference by predicting how buildings and other structures will move. I believe that infrastructure is the foundation of a healthy, cohesive society.”

Elizabeth Stavrakis
Master of Engineering (Structural)
Graduate Engineer, Mott MacDonald

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WHY CHOOSE ENGINEERING OR IT?

ENGINEERING AND IT AT MELBOURNE

The Melbourne Model is an Australian first, aligned with the top international universities. We designed it to help graduates develop the flexible mindset and strong technical skills required to solve future challenges and make a difference on a global scale.

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 groundbreaking 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 industry projects and exciting innovation challenges with industry mentors.

Working alongside students from over 100 countries around the world, you can, start building your own global network at Australia’s leading university for engineering and technology.

The Melbourne Advantage

Be inspired by leading researchers: Study at Australia’s No.1 university for engineering and technology. Ranked No. 27 worldwide.

Be internationally recognised: Maximise your career opportunities around the world with accreditation from Engineers Australia, EUR-ACE®, and more.

Be industry connected: No.7 in the world for graduate employability. Participate in internships, industry projects and innovation challenges.

Be flexible and focused: Have the flexibility to try different types of engineering or IT, or focus on your preferred field from day one. Build skills in other areas like business or languages for a competitive edge.

Engineers are in high demand. As an engineering graduate, you can access a vast range of interesting and well-paid employment opportunities around the world. Meet the health challenges of the future, design infrastructure to handle increasing populations, tackle the world’s growing need for food, and more.

Information technology continues to transform our society, impacting business, health, entertainment, and more. Whether you’re working with big data, artificial intelligence, or cybersecurity, as an IT professional you will be shaping the technology of the future. You’ll be qualified to work in all kinds of settings – from your own start-up company to multinational corporations and government.
WHICH TYPE OF ENGINEERING IS FOR ME?

Engineers use creativity, analytical skills and scientific understanding to create solutions to critical problems in health, energy, infrastructure, information technology, the environment, communications, transport, robotics and more.

<table>
<thead>
<tr>
<th>DO YOU ENJOY?</th>
<th>WHAT DO THESE ENGINEERS DO?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIOMEDICAL ENGINEERING</strong></td>
<td>Biology, health and maths</td>
</tr>
<tr>
<td></td>
<td>Collaborate with doctors and clinicians to ensure our bodies can take us further.</td>
</tr>
<tr>
<td><strong>CHEMICAL AND BIOCHEMICAL ENGINEERING</strong></td>
<td>Chemistry and maths</td>
</tr>
<tr>
<td></td>
<td>Address critical global problems in energy, environmental remediation, food, water supply and drug delivery.</td>
</tr>
<tr>
<td><strong>CIVIL AND STRUCTURAL ENGINEERING</strong></td>
<td>Physics and maths</td>
</tr>
<tr>
<td></td>
<td>Plan, design and construct airports, harbours, highways, water resources, railways, structures, and more.</td>
</tr>
<tr>
<td><strong>ELECTRICAL ENGINEERING</strong></td>
<td>Physics and maths</td>
</tr>
<tr>
<td></td>
<td>Create solutions in medical bionics, telecommunications, neural engineering, energy conversion, power distribution, and more.</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL ENGINEERING</strong></td>
<td>Environmental studies, physics and maths</td>
</tr>
<tr>
<td></td>
<td>Tackle climate change, bushfire management, energy systems, water resources and waste management.</td>
</tr>
<tr>
<td><strong>MATERIALS ENGINEERING</strong></td>
<td>Chemistry and maths</td>
</tr>
<tr>
<td></td>
<td>Create new materials or improve existing ones for biomedical devices, sustainable energy and manufacturing processes.</td>
</tr>
<tr>
<td><strong>MECHANICAL ENGINEERING</strong></td>
<td>Physics and maths</td>
</tr>
<tr>
<td></td>
<td>Convert energy into power and motion and work in biomechanics, energy, transport, aeronautics, automotive or climate change.</td>
</tr>
<tr>
<td><strong>MECHATRONICS</strong></td>
<td>Physics, programming and maths</td>
</tr>
<tr>
<td></td>
<td>Blend electrical, software and mechanical engineering to create machines and smart devices.</td>
</tr>
<tr>
<td><strong>SOFTWARE ENGINEERING</strong></td>
<td>Programming and maths</td>
</tr>
<tr>
<td></td>
<td>Develop and maintain software systems for business, health, manufacturing, entertainment and more.</td>
</tr>
<tr>
<td><strong>SPATIAL INFORMATION</strong></td>
<td>Geography and maths</td>
</tr>
<tr>
<td></td>
<td>Use measurement, mapping and visualisation in GPS, remoting sensing, surveying, and more.</td>
</tr>
</tbody>
</table>
If you love innovation and discovering how things work, or are passionate about inventing, designing and creating solutions for society, take the first step to a global career as an accredited engineer at Melbourne.

<table>
<thead>
<tr>
<th>Projects at Melbourne</th>
<th>Career Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A biomedical engineer in biotechnology, hospitals and start-ups.</td>
<td>A chemical or biochemical engineer in bioremediation, food and beverage, oil, gas and water treatment.</td>
</tr>
<tr>
<td>A civil or structural engineer in construction, oil and gas, transport and water resources.</td>
<td>An electrical engineer in automation, aviation, power generation and telecommunications.</td>
</tr>
<tr>
<td>An environmental engineer in conservation, renewable energy, mining, resource planning and water resources.</td>
<td>A materials engineer in industrial design, manufacturing, aerospace and biotechnology.</td>
</tr>
<tr>
<td>A mechanical engineer in aerospace, biomechanics, manufacturing, minerals, energy, robotics and transport.</td>
<td>A mechatronics engineer in aeronautics, automotive, computing, robotics and transport.</td>
</tr>
<tr>
<td>A software engineer in cybersecurity, disaster management, financial services, healthcare, telecommunications and transport.</td>
<td>A spatial engineer in aeronautics, mining, property, transport and urban planning.</td>
</tr>
</tbody>
</table>
At Melbourne, we offer students a world-class curriculum aligned with the top international universities.

To become a professionally accredited engineer you’ll complete a three-year bachelor’s degree with a major in engineering, followed by a two-year Master of Engineering. Studying engineering from day one, you’ll also build expertise in areas outside your discipline for a competitive edge.

As a Melbourne graduate you will enter the engineering profession with a higher level qualification, and the ideal combination of technical, analytical and interpersonal skills valued by employers.

**Your study options**

1. **Graduate Degree Package**
   Enrol into both a University of Melbourne bachelor’s degree and Master of Engineering degree through VTAC. Graduate Degree Packages into the Master of Engineering are available through the Bachelors of Biomedicine, Commerce, Design and Science for students who achieve a 96.00 ATAR or above. This option guarantees your Commonwealth Supported Place* (CSP) into the Master of Engineering.

2. **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* into the Master of Engineering, if you achieve a weighted average mark of 65% or higher in your bachelor’s degree.

3. **Any bachelor degree**
   If you study any undergraduate degree without an engineering major you are still guaranteed a CSP* in the Master of Engineering, provided you achieve weighted average mark of 65% or higher in your bachelor’s degree, and meet the maths and science entry requirements. If you follow this path, you’ll be eligible for the three-year Master of Engineering.

   *see page 42 for CSP eligibility

4. **Melbourne Chancellor’s Scholarship**
   The Melbourne Chancellor’s Scholarship guarantees high-achieving students entry into the Master of Engineering. It is available to Australian Year 12 or International Baccalaureate (IB) students who achieve an ATAR of 99.90 or higher.

   *or full fee paying place for an international student

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*The Master of Engineering provided me with a great technical understanding of my field, and has also allowed me to develop interpersonal and workplace skills. I feel more confident to head out into the workforce now than I did directly out of my bachelors degree.*

**Sarah Fink**

Master of Engineering (Biomedical)
Bachelor of Science (Bioengineering Systems major)
Co-founder & Director, SWADE Medtech
Design Engineer, OMX Solutions
Which degree?

• Complement your engineering skills with medical knowledge

Available engineering majors

• Bioengineering Systems

Graduate degree package

96.00

Domestic minimum ATAR 2019 / Selection rank

96.00 / 95.00

International guaranteed ATAR 2019

96.00

Undergraduate Prerequisites

A study score of at least 25 in English/English Language/Literature or at least 30 in EAL.
AND
At least 25 in Chemistry and in Mathematical Methods or Specialist Mathematics

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

Entry into the two-year Master of Engineering

• Biomedical
• Biomedical with Business

Achieve employment opportunities around the world as an accredited engineer

1. The Bachelor of Biomedicine, Design and Science are three-years full-time (or part-time equivalent). CSP and international fee places are available.
2. Students who undertake the Computing major are eligible for 237.5 point Master of Engineering, which is equivalent to 2.5 years full-time study.
3. Based on the Australian VCE curriculum VCE Units 3 and 4.
4. Students who complete the corresponding major in their bachelor degree will be eligible to enter the 2 year Master of Engineering. The 2.5 or 3 year Master of Engineering or Master of Engineering (with Business) is available for students who do not study the corresponding undergraduate major, provided they have undertaken relevant maths and science subjects.
Shing’s startup, NAVi Technologies, is working on a device to increase the accuracy of catheter placement in newborns. They’ve received more than $200,000 in funding and aim to have a fully-functional prototype within the next 12 months.

Shing Yue Sheung
Master of Engineering (Biomedical)
Chief Operating Officer, NAVi Medical Technologies

ABOUT BIOMEDICAL ENGINEERING

Want to design a new medical device, or solve a clinical problem to help patients in need? As life expectancies increase, engineers, doctors and clinicians are working together to ensure our bodies can take us further than ever before. By blending biomedical science and engineering, you’ll be prepared to meet the health challenges of our future. If you are passionate about biology, health and maths, then biomedical engineering could be the career for you.

Bioengineering Systems major

Start your biomedical engineering studies with the Bioengineering Systems major, available in the Bachelor of Biomedicine or Science. You’ll focus on biology, biomechanics and designing biosystems.

To become an accredited engineer, you’ll then complete the Master of Engineering. You can focus on biomedical engineering, or combine biomedical engineering with business.
STUDENT EXPERIENCE
As a biomedical engineering student, you’ll have access to internships, visit local research institutes and hospitals and work on projects with real-world outcomes for patients and clinicians. Want to create your own biomedical devices or parts? Access our state-of-the-art 3D printing facilities, and fabricate your own biomedical components, from prosthetics to pacemakers.

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 biomedical engineering graduates are working at organisations such as the Bionics Institute, Cerner Corporation, Eastern Health, Royal Children’s Hospital and Toshiba Medical Systems.

STUDY THE BIOENGINEERING SYSTEMS MAJOR IN THE BACHELOR OF BIOMEDICINE OR SCIENCE
Bachelor of Biomedicine (Bioengineering Systems Major)

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chemistry for Biomedicine</td>
<td>Calculus 2</td>
</tr>
<tr>
<td></td>
<td>Biomolecules and Cells</td>
<td>Breadth</td>
</tr>
<tr>
<td></td>
<td>Engineering Systems Design 2</td>
<td>Linear Algebra</td>
</tr>
<tr>
<td></td>
<td>Genes and Environment</td>
<td>Breadth</td>
</tr>
<tr>
<td>2</td>
<td>Engineering Mathematics</td>
<td>Molecular and Cellular Biomedicine</td>
</tr>
<tr>
<td></td>
<td>Biomechanical Physics and Computation</td>
<td>Human Structure and Function</td>
</tr>
<tr>
<td></td>
<td>Breadth</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Introduction to Biomechanics</td>
<td>Circuits and Systems</td>
</tr>
<tr>
<td></td>
<td>Biomedicine: Molecule to Malady</td>
<td>Breadth</td>
</tr>
<tr>
<td></td>
<td>Biotransport Processes</td>
<td>Biosystems Design</td>
</tr>
<tr>
<td></td>
<td>Frontiers in Biomedicine</td>
<td>Breadth</td>
</tr>
</tbody>
</table>

FOLLOWED BY THE MASTER OF ENGINEERING (BIOMEDICAL)

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clinical Trials and Regulations</td>
<td>Bioinstrumentation</td>
</tr>
<tr>
<td></td>
<td>Introduction to Biomechanics</td>
<td>Bioengineering elective</td>
</tr>
<tr>
<td></td>
<td>Anatomy and Physiology for Engineers</td>
<td>Anatomy and Physiology for Engineers</td>
</tr>
<tr>
<td></td>
<td>Bioengineering elective</td>
<td>Bioengineering elective</td>
</tr>
<tr>
<td>2</td>
<td>Biomedical Engineering Project Capstone</td>
<td>Engineering Practice and Communication / Innovative Engineering</td>
</tr>
<tr>
<td></td>
<td>Bioengineering elective</td>
<td>Approved elective*</td>
</tr>
<tr>
<td></td>
<td>Biomedical Engineering Design Project</td>
<td>Bioengineering elective</td>
</tr>
<tr>
<td></td>
<td>Approved elective*</td>
<td>Approved elective*</td>
</tr>
</tbody>
</table>

Or, followed by the Master of Engineering (Biomedical with Business)
Your course plan will be the same as the Master of Engineering (Biomedical), except you’ll replace five elective subjects with business subjects: World of Engineering Management; Engineering Contracts and Procurement; Marketing Management for Engineers; Economic Analysis for Engineers; and Strategy Execution for Engineers.

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.
ABOUT CHEMICAL, BIOCHEMICAL AND MATERIALS ENGINEERING

Chemical and biochemical engineers are meeting the world’s growing need for food, energy and water. They play a role in preserving our environment, as well as developing solutions to heal our bodies. Materials engineering enables us to create and enhance the materials underpinning our devices and technologies. If you are passionate about chemistry and maths, consider studying chemical, biochemical or materials engineering.

Chemical Systems major
Start your chemical engineering studies with the Chemical Systems major, available in the Bachelor of Science. You’ll focus on chemistry, chemical process analysis, reactor engineering and safety and sustainability.

To become an accredited engineer, you’ll then complete the Master of Engineering. You can choose from four specialisations, including Chemical, Chemical with Business, Biochemical or Materials.

“There’s a big focus on renewable energy and sustainability in mining, oil and gas. In the food and beverage industry, it’s all about waste management. At Melbourne, I loved the opportunity to explore different subjects, such as food engineering, wastewater and biology.”

Sarah Chambers
Master of Engineering (Chemical)
Bachelor of Science (Chemical Systems major)
Supply Graduate, Carlton United Breweries
STUDENT EXPERIENCE
As a chemical engineering student, you’ll have access to internships and take part in site visits. You’ll have the opportunity to work on industry projects, where you can build connections with organisations working in minerals processing, food and beverage, water resources and oil and gas.

YOUR CAREER
Access career opportunities as a chemical, biochemical or materials engineer in industries such as manufacturing, cosmetics, food and beverage production, oil and gas, pharmaceuticals and waste 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.

STUDY THE CHEMICAL SYSTEMS MAJOR THROUGH THE BACHELOR OF SCIENCE

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester 1</th>
<th>Engineering Systems Design 1</th>
<th>Calculus 2</th>
<th>Chemistry 1</th>
<th>Breadth or Science elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 2</td>
<td>Engineering Systems Design 2</td>
<td>Linear Algebra</td>
<td>Chemistry 2</td>
<td>Breadth or Science elective</td>
<td></td>
</tr>
</tbody>
</table>

| Year 2 | Semester 1 | Material and Energy Balances | Chemistry: Reactions and Synthesis | Science elective | |
| --- | --- | --- | --- | --- | |
| Semester 2 | Chemical Process Analysis | Transport Processes | Engineering Mathematics | Breadth | |

| Year 3 | Semester 1 | Reactor Engineering | Heat and Mass Transport Processes | Science elective | |
| --- | --- | --- | --- | --- | |
| Semester 2 | Fluid Mechanics | Safety and Sustainability Case Studies | Science elective | Breadth | |

FOLLOWED BY THE MASTER OF ENGINEERING (CHEMICAL)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester 1</th>
<th>Engineering Practice and Communication / Creating Innovative Engineering</th>
<th>Chemical Engineering Thermodynamics</th>
<th>Bioprocess Engineering</th>
<th>Chemical Engineering Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 2</td>
<td>Process Equipment Design</td>
<td>Process Dynamics and Control</td>
<td>Chemical Engineering Research Project or Industry Project</td>
<td>Chemical Engineering elective</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Semester 1</th>
<th>Particle Mechanics and Processing</th>
<th>Advanced Heat and Mass Transport Processes</th>
<th>Process Engineering</th>
<th>Chemical Engineering elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 2</td>
<td>Chemical Engineering Design Project</td>
<td></td>
<td></td>
<td>Chemical Engineering elective</td>
<td></td>
</tr>
</tbody>
</table>

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.

Or, followed by the Master of Engineering (Chemical with Business)
Your course plan will be the same as the Master of Engineering (Chemical), except you’ll replace five elective subjects with business subjects: World of Engineering Management; Engineering Contracts and Procurement; Marketing Management for Engineers; Economic Analysis for Engineers; and Strategy Execution for Engineers.

If you’ve undertaken the Chemical Systems major, you’ll also be eligible to enter the Master of Engineering (Biochemical) or (Materials).
“I took a foundation engineering subject and was fascinated by the fusion of creative design, mathematics and physics that engineering offered.

Leaving a positive and long-lasting impact on society through innovative and sustainable infrastructure is the reason I chose to pursue an engineering career.”

**Alison Mantegazza**
Master of Engineering (Civil)
Bachelor of Science (Civil Systems major)
Civil Engineer, Jacobs
STUDENT EXPERIENCE

As a civil engineering student, you’ll have access to internships, engage with industry professionals and work on projects such as detecting cracks in bridges using drones. You could even gain insight into what it’s like working as a structural engineer, working on a real-world problem provided by an industry guest lecturer.

YOUR CAREER

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

STUDY THE CIVIL SYSTEMS MAJOR IN THE BACHELOR OF DESIGN OR SCIENCE

Bachelor of Design (Civil Systems major)

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

FOLLOWED BY THE MASTER OF ENGINEERING (CIVIL)

| Year 1 | Semester 1 | Structural Theory and Design 2 | Sustainable Infrastructure Engineering | Engineering Site Characterisation | Geotechnical Engineering |
| Year 1 | Semester 2 | Engineering Project Implementation | Civil Hydraulics | Transport Systems | Engineering Practice and Communication or Creating Innovative Engineering |
| Year 2 | Semester 1 | IE Research Project 1 | Risk Analysis | Integrated Design (Civil) | Civil Engineering elective |
| Year 2 | Semester 2 | | Construction Engineering | Civil Engineering elective | Civil Engineering elective |

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.

Or, followed by the Master of Engineering (Civil with Business)

Your course plan will be the same as the Master of Engineering (Civil), except you’ll replace five elective subjects with business subjects: World of Engineering Management; Engineering Contracts and Procurement; Marketing Management for Engineers; Economic Analysis for Engineers; and Strategy Execution for Engineers.

If you’ve undertaken the Civil Systems major, you’ll also be eligible to enter the Master of Engineering (Structural).
In his final year project in the Master of Engineering, Dhanuka collaborated with the Metropolitan Fire Brigade (MFB) to develop a real-time locating solution called the Live Emergency Personnel Tracking (LEPT) system.

The system is designed to track firefighters and other deployed personnel during emergency situations, such as bushfires or structural fires.

“My favourite part of the Master of Engineering has been the opportunity to apply my theoretical skills to practical engineering projects, such as the LEPT system.”

Dhanuka Nanayakkara
Master of Engineering (Electrical)
Consultant, Solution 49x at KPMG
As an electrical engineering student, you’ll have access to internships, build electronic devices such as handheld games consoles and work on real-world projects, such as smart meters or drones.

You could work as an electrical engineer in industries such as aviation, broadcast or sound engineering, power generation and transmission and telecommunications. Our engineering graduates are working in organisations such as Accenture, AECOM, Deloitte, ExxonMobil, Google, Tesla and Telstra.

STUDY BACHELOR OF SCIENCE WITH A MAJOR IN ELECTRICAL SYSTEMS

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester 1</th>
<th>Engineering Systems Design 1</th>
<th>Calculus 2</th>
<th>Physics 1</th>
<th>Breadth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2</td>
<td>Semester 1</td>
<td>Engineering Systems Design 2</td>
<td>Linear Algebra</td>
<td>Physics 2: Physical Science and Technology</td>
<td>Breadth</td>
</tr>
<tr>
<td>Year 2</td>
<td>Semester 1</td>
<td>Engineering Computation</td>
<td>Engineering Mathematics</td>
<td>Science elective</td>
<td>Breadth</td>
</tr>
<tr>
<td>Year 2</td>
<td>Semester 2</td>
<td>Foundations of Electrical Networks</td>
<td>Engineering Mechanics</td>
<td>Science elective</td>
<td>Breadth</td>
</tr>
<tr>
<td>Year 3</td>
<td>Semester 1</td>
<td>Digital Systems Design</td>
<td>Electrical Network Analysis and Design</td>
<td>Science elective</td>
<td>Breadth</td>
</tr>
<tr>
<td>Year 3</td>
<td>Semester 2</td>
<td>Electrical Device Modelling</td>
<td>Signals and Systems</td>
<td>Recommended Science elective (Electronic System Implementation)</td>
<td>Breadth</td>
</tr>
</tbody>
</table>

FOLLOWED BY THE MASTER OF ENGINEERING (ELECTRICAL)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester 1</th>
<th>Probability and Random Models</th>
<th>Digital Systems Design</th>
<th>Electronic Circuit Design</th>
<th>Introduction to Power Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Semester 2</td>
<td>Communication Systems</td>
<td>Signal Processing</td>
<td>Embedded System Design</td>
<td>Control Systems</td>
</tr>
<tr>
<td>Year 2</td>
<td>Semester 1</td>
<td>Electrical Engineering Capstone Project</td>
<td>Electrical Engineering elective</td>
<td>Electrical Engineering elective</td>
<td>Approved elective</td>
</tr>
<tr>
<td>Year 2</td>
<td>Semester 2</td>
<td>Electrical Engineering elective</td>
<td>Electrical Engineering elective</td>
<td>Electrical Engineering elective</td>
<td>Approved elective</td>
</tr>
</tbody>
</table>

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.

Or, followed by the Master of Engineering (Electrical with Business)

Your course plan will be the same as the Master of Engineering (Electrical), except you’ll replace five elective subjects with business subjects: World of Engineering Management; Engineering Contracts and Procurement; Marketing Management for Engineers; Economic Analysis for Engineers; and Strategy Execution for Engineers.
Andrew undertook an internship with Alluvium Consulting, and now works for the waterway engineering company as a graduate engineer.

“During my internship I worked on a range of engineering design projects using design and modelling software.

“As well as improving my technical skills, this gave me the opportunity to learn about professional engineering practice, workplace management and the importance of client relationships.”

Andrew John
Master of Engineering (Environmental)
Graduate Environmental Engineer, Alluvium Consulting

ABOUT ENVIRONMENTAL ENGINEERING

Environmental engineers improve the liveability of our cities and sustainability of our resources. With a degree in environmental engineering, you could design sustainable solutions to climate change, water scarcity, energy and bushfire management.

Environmental Engineering Systems major

Start your environmental engineering studies with the Environmental Engineering Systems major, available in the Bachelor of Science. You’ll undertake an investigative project developing, building, operating and evaluating a small-scale environmental engineering system, which will provide valuable insight into what it’s like to work in industry.

To become an accredited engineer, you’ll then complete the Master of Engineering (Environmental).
Our world-leading environmental engineering research: Digital vineyards

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 China, Vietnam, Thailand, Nepal, Sri Lanka and India. You’ll also have the flexibility to choose your environmental engineering focus – developing expertise in energy, waste management or water resources.

YOUR CAREER
You could work as an environmental engineer in industries such as conservation, renewable energy, mining, oil and gas, 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.

STUDY THE ENVIRONMENTAL ENGINEERING SYSTEMS MAJOR THROUGH THE BACHELOR OF SCIENCE

Year 1
Semester 1: Engineering Systems Design 1, Calculus 2, Biology of Cells and Organisms
Semester 2: Engineering Systems Design 2, Linear Algebra, Genetics and the Evolution of Life

Year 2
Semester 1: Engineering Mechanics, Engineering Mechanics
Semester 2: Earth Processes for Engineering, Analysis of Biological Data, Thinking Scientifically

Year 3
Semester 1: Fluid Mechanics, Imaging the Environment, Land Administration Systems
Semester 2: Environmental Engineering Systems Capstone, Biotransport Processes, Systems Modelling and Design

FOLLOWED BY THE MASTER OF ENGINEERING (ENVIRONMENTAL)

Year 1
Semester 1: Quantitative Environmental Modelling, Sustainable Infrastructure Engineering, Engineering Site Characterisation
Semester 2: Engineering Project Implementation, Civil Hydraulics, Environmental Analysis Tools

Year 2
Semester 1: IE Research Project 1, Environmental Engineering elective, Integrated Design (Infrastructure) OR Integrated Design (Civil)
Semester 2: Environmental Engineering elective, Environmental Engineering elective, Environmental Engineering elective

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.
Mechanical engineering offers a fundamental understanding of how you can use maths and physics to solve problems. Studying the Master of Engineering has given me a better understanding of my field and the confidence to tackle problems I haven’t come across before.”

James Gregory
Master of Engineering (Mechanical)
Bachelor of Science (Mechanical Systems major)
Design Engineer, Boeing Aerostructures Australia

ABOUT MECHANICAL ENGINEERING

Mechanical engineers design, construct, operate and maintain machines, robots, energy systems and manufacturing equipment – practically anything with moving parts. By studying mechanical engineering, you could help develop new products like mobile phones, gaming consoles, cars and wind turbines, or the robots that make them. If you enjoy maths or physics, explore where study in mechanical in engineering could take you.

Mechanical Systems major
Start your mechanical engineering studies with the Mechanical Systems major, available in the Bachelor of Design or Science. You’ll focus on physics, mechanical design, thermodynamics and fluid mechanics.

To become an accredited engineer, you’ll then complete the Master of Engineering. You can choose to focus on mechanical engineering, or you can combine your mechanical engineering study with business or aerospace.
As a mechanical engineering student, you’ll have access to internships, learn in cutting-edge laboratories and take part in site visits. Volunteer for the Melbourne Space Program, a group of students with a vision to build a nanosatellite and launch it into orbit. Or you could join the MUR Motorsports team, and help design and build a racecar!

As a Melbourne graduate, you’ll be equipped to work as a mechanical engineer in industries such as aerospace, biomechanics, manufacturing, minerals, energy, robotics, transport and more. Our mechanical engineering graduates are working in companies such as Arup, CSIRO, ExxonMobil, Mars Australia, Telstra and Yarra Trams.

STUDENT EXPERIENCE

STUDY THE MECHANICAL SYSTEMS MAJOR THROUGH THE BACHELOR OF DESIGN OR SCIENCE

Bachelor of Science (Mechanical Systems major)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tbody>
<tr>
<td>Semester 1</td>
<td>Semester 1</td>
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<tr>
<td>Engineering Systems</td>
<td>Engineering Computation</td>
<td>Systems Modelling and</td>
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<tr>
<td>Design 1</td>
<td></td>
<td>Fluid Mechanics</td>
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<tr>
<td>Calculus 2</td>
<td>Science elective</td>
<td>Mechanical Design</td>
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<tr>
<td>Physics 1</td>
<td>Science elective</td>
<td>Science elective</td>
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<td>Breadth</td>
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<td>Semester 2</td>
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<tr>
<td>Engineering Systems</td>
<td>Engineering Mechanics</td>
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<td>Design 2</td>
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<tr>
<td>Linear Algebra</td>
<td>Engineering Mathematics</td>
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<tr>
<td>Physics 2: Physical Science and Technology</td>
<td>Science elective</td>
<td>Breadth</td>
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FOLLOWED BY THE MASTER OF ENGINEERING (MECHANICAL)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tbody>
<tr>
<td>Semester 1</td>
<td>Semester 1</td>
<td>Semester 1</td>
</tr>
<tr>
<td>Dynamics</td>
<td>Mechanical Engineering</td>
<td>Thermodynamics</td>
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<tr>
<td>Control Systems</td>
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</tr>
<tr>
<td>Materials</td>
<td>Mechanical Engineering</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Design for Manufacture</td>
<td>elective</td>
<td>elective</td>
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<tr>
<td>Semester 2</td>
<td>Semester 2</td>
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<tr>
<td>Fluid Dynamics</td>
<td>Mechanical Engineering</td>
<td>Mechanical Engineering</td>
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<td></td>
<td>elective</td>
<td>elective</td>
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<tr>
<td>Solid Mechanics</td>
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</tr>
<tr>
<td>Engineering Practice and Communication / Creating Innovative Engineering</td>
<td>Mechanical Engineering</td>
<td>Capstone Project</td>
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<tr>
<td>Design for Integration</td>
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FOLLOWED BY THE MASTER OF ENGINEERING (MECHANICAL with Business)

Or, the followed by the Master of Engineering (Mechanical with Business)

Your course plan will be the same as the Master of Engineering (Mechanical), except you’ll replace five elective subjects with business subjects: World of Engineering Management; Engineering Contracts and Procurement; Marketing Management for Engineers; Economic Analysis for Engineers; and Strategy Execution for Engineers.

STUDY THE MECHANICAL SYSTEMS MAJOR THROUGH THE BACHELOR OF DESIGN OR SCIENCE

Bachelor of Science (Mechanical Systems major)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tbody>
<tr>
<td>Semester 1</td>
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<tr>
<td>Engineering Systems</td>
<td>Engineering Computation</td>
<td>Systems Modelling and</td>
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<tr>
<td>Design 1</td>
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<td>Fluid Mechanics</td>
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<tr>
<td>Calculus 2</td>
<td>Science elective</td>
<td>Mechanical Design</td>
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<td>Physics 1</td>
<td>Science elective</td>
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<td>Breadth</td>
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<tr>
<td>Semester 2</td>
<td>Semester 2</td>
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<tr>
<td>Engineering Systems</td>
<td>Engineering Mechanics</td>
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<td>Design 2</td>
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<tr>
<td>Linear Algebra</td>
<td>Engineering Mathematics</td>
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<tr>
<td>Physics 2: Physical Science and Technology</td>
<td>Science elective</td>
<td>Breadth</td>
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<td>Breadth</td>
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</table>

FOLLOWED BY THE MASTER OF ENGINEERING (MECHANICAL with Aerospace)

Or, the followed by the Master of Engineering (Mechanical with Aerospace)

Your course plan will be the same as the Master of Engineering (Mechanical), except you’ll replace five elective subjects with Aerospace subjects.

The five aerospace subjects are: Advanced Fluid Dynamics; Computational Fluid Dynamics; Aerospace Dynamics and Control; Aerospace Propulsion; and Vibration and Aeroelasticity.
With the support of an industry partner, Elena and her team are developing an autonomous, self-charging drone. “The project arose due to the Black Saturday fires, where fires were caused by the ill-maintenance of power lines. “Our idea was to design an autonomous drone that could inspect those lines. And because drones have such a short flight time, the drone would also have the ability to charge inductively off the power line. Then it could fly interstate and operate 24/7 – it would be cheaper, faster and safer than current alternatives.”

Elena Vella
Master of Engineering (Mechatronics)
Bachelor of Science (Mechatronics Systems)
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, UAV platforms and large-scale water management systems.

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 are working in organisations such as IBM, Telstra, Ford, KPMG and Alerte Digital Health.

STUDY THE MECHATRONICS SYSTEMS MAJOR THROUGH THE BACHELOR OF SCIENCE

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td></td>
<td>Engineering Systems Design 1</td>
<td>Calculus 2</td>
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<tr>
<td></td>
<td>Physics 1</td>
<td>Breadth</td>
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<table>
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<tr>
<th>Year 2</th>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td></td>
<td>Engineering Computation</td>
<td>Linear Algebra</td>
</tr>
<tr>
<td></td>
<td>Engineering Mathematics</td>
<td>Physics 2: Physical Science and Technology</td>
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<td></td>
<td>Science elective</td>
<td>Breadth</td>
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<table>
<thead>
<tr>
<th>Year 3</th>
<th>Semester 1</th>
<th>Semester 2</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Analog and Digital Electronics Concepts</td>
<td>Science elective</td>
</tr>
<tr>
<td></td>
<td>Mechatronic System Design</td>
<td>Science elective</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td></td>
<td>Systems Modelling and Analysis</td>
<td>Numerical Programming for Engineers</td>
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<td></td>
<td>Breadth</td>
<td>Breadth</td>
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</table>

FOLLOWED BY THE MASTER OF ENGINEERING (MECHATRONICS)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester 1</th>
<th>Semester 2</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Control Systems</td>
<td>Dynamics</td>
</tr>
<tr>
<td></td>
<td>Engineering Practice and Communication</td>
<td>Programming and Software Development</td>
</tr>
<tr>
<td></td>
<td>Internet Technologies OR Knowledge Technologies</td>
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</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Advanced Control Systems</td>
<td>Advanced Dynamics</td>
</tr>
<tr>
<td></td>
<td>Embedded System Design</td>
<td>Mechatronics Capstone Project</td>
</tr>
</tbody>
</table>

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.
“Technology is infiltrating every aspect of our lives. The ability to apply problem solving and creative thinking skills sold me on software engineering.”

Outside of her studies, Grace volunteers for CISSA, the Computing and Information Systems Student Association at the University of Melbourne.

“CISSA aims to create a community that provides equal opportunities and visibility for minority groups in technology. Throughout the year, we provide a range of workshops, activities and hackathons to help them find out about careers in tech and improve their skills.”

Grace Johnson
Master of Engineering (Software)
STUDENT EXPERIENCE

As a software engineering student, you’ll have access to internships, deliver a software solution for an industry client and hear from industry practitioners in guest lectures. You’ll use state-of-the-art software technologies and frameworks to develop software solutions to real-world problems.

YOUR CAREER

Access career opportunities as a software engineer in industries such as games and entertainment, cybersecurity, disaster management, financial services, healthcare and transport. Our engineering graduates are working in organisations such as ANZ, Deloitte, Microsoft and Telstra.

STUDY THE COMPUTING AND SOFTWARE SYSTEMS MAJOR THROUGH THE BACHELOR OF SCIENCE

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

FOLLOWED BY THE MASTER OF ENGINEERING (SOFTWARE)

| Year 1 | Semester 1 | Software Requirements Analysis | IT Project and Change Management | Engineering Practice and Communication / Creating Innovative Engineering | Internet Technologies |
| Year 1 | Semester 2 | Masters Software Engineering Project | Software Testing and Reliability | CIS elective | CIS Advanced elective |
| Year 2 | Semester 1 | Masters Advanced Software Project | High Integrity Systems Engineering | Modelling Complex Software Systems | CIS Advanced elective |
| Year 2 | Semester 2 | | Software Design and Architecture | CIS Advanced elective | Approved elective* |

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.

Or, followed by the Master of Engineering (Software with Business)

Your course plan will be the same as the Master of Engineering (Software), except you’ll replace five elective subjects with business subjects: World of Engineering Management; Engineering Contracts and Procurement; Marketing Management for Engineers; Economic Analysis for Engineers; and Strategy Execution for Engineers.

If choose the Computing major in the Bachelor of Design, you’ll be eligible for the 2.5 year Master of Engineering (Software) or (Software with Business).
Amanda has always been passionate about geography and maps – it’s what led her to study spatial engineering and become involved in the humanitarian initiative Missing Maps.

“In my spare time I volunteer for Missing Maps, where I help respond to a disaster occurring somewhere in the world and remotely map buildings or features of interest from satellite imagery online.”

**Amanda Chong**
Master of Engineering (Spatial) Geospatial Analyst, Arup

**ABOUT SPATIAL INFORMATION AND ENGINEERING**

In a world where everything is geolocated, spatial information is at the forefront of the Internet of Things, autonomous vehicles and how our cities work. Spatial engineers and analysts use science and technology to measure, map and visualise our world. They create solutions in traffic control, disaster management and more. If you enjoy geography and maths, consider studying spatial information or engineering.

**Spatial Systems major**
Start your studies in spatial information or engineering with the Spatial Systems major, available in the Bachelor of Design or Science. You’ll gain skills in imaging the environment, spatial computing and mapping and using Geographic Information System (GIS).
STUDENT EXPERIENCE
You’ll have access to internships, take part in hands-on, outdoor assignments and visit our regional Dookie campus for a four-day fieldwork program. Learn from experts in the field, including disaster management, land administration, 3D modelling and smart cities.

YOUR CAREER
You could work as a spatial engineer or analyst in industries such as aeronautics, land and resources, property, transport and urban planning. Our graduates are working in organisations such as Arup, ThinkSpatial, Jacobs and JRL Land Surveyors.

STUDY THE SPATIAL SYSTEMS MAJOR THROUGH THE BACHELOR OF DESIGN OR SCIENCE
Bachelor of Science (Spatial Systems major)

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td>1</td>
<td>Foundations of Computing</td>
<td>Science elective</td>
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<tr>
<td></td>
<td>Science elective</td>
<td>Linear Algebra</td>
</tr>
<tr>
<td>2</td>
<td>Applications of GIS</td>
<td>Engineering Computation</td>
</tr>
<tr>
<td></td>
<td>Surveying and Mapping</td>
<td>Database Systems</td>
</tr>
<tr>
<td>3</td>
<td>Engineering Risk Analysis</td>
<td>Imaging the Environment</td>
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<td></td>
<td>Integrated Spatial Systems</td>
<td>Land Administration Systems</td>
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</table>

FOLLOWED BY THE MASTER OF ENGINEERING (SPATIAL)
For students seeking to become accredited engineers

<table>
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<tr>
<th>Year</th>
<th>Semester 1</th>
<th>Semester 2</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Foundations of Spatial Information</td>
<td>Approved elective</td>
</tr>
<tr>
<td></td>
<td>Database Systems</td>
<td>Satellite Positioning Systems</td>
</tr>
<tr>
<td>2</td>
<td>Advanced Surveying and Mapping</td>
<td>Spatial Databases</td>
</tr>
<tr>
<td></td>
<td>Approved elective</td>
<td>Engineering Project Implementation</td>
</tr>
</tbody>
</table>

ALTERNATIVE GRADUATE PATHWAYS
Want to focus on spatial information and its role in information technology? You could choose to continue your studies with the Master of Information Technology, specialising in spatial.
“I’ve always been passionate about computing, since getting our first Internet-connected computer at age seven, to building my first program at age fifteen.”

Alastair Paterson
Bachelor of Commerce
Master of Engineering (Software)
Development Ops Delivery Engineer, reecetech
Combine your passion for business and leadership with technical engineering skills. You can start with a Bachelor of Commerce, then enter the three-year Master of Engineering, provided you meet the maths and science entry requirements.

**GRADUATE DEGREE PACKAGES (GDP)**

High-achieving students can enrol in the Bachelor of Commerce/Master of Engineering Graduate Degree Package through the VTAC process. If you achieve an ATAR of 96 or above, you will secure a Commonwealth Supported Place into the three-year Master of Engineering, provided you meet the maths and science entry requirements.

**ENTRY REQUIREMENTS:**
- ATAR: 96.00
- Prerequisites: At least 25 in any English or at least 30 in EAL and at least 25 in Maths Methods or Specialist Maths

**STEP 1.** Take one maths and two science subjects as breadth

**STEP 2.** Enter the Master of Engineering or Master of Engineering (with Business) three year program.

**STANDARD ENTRY**

**ENTRY REQUIREMENTS:**
- Domestic minimum ATAR 2019: 93.00
- Domestic selection rank ATAR 2018: 93.05
- Domestic guaranteed ATAR 2019: 95.00
- International guaranteed ATAR 2019: 94.00
- Prerequisites: At least 25 in any English or at least 30 in EAL and at least 25 in Maths Methods or Specialist Maths

**STEP 1.** Take one maths and two science subjects as breadth

**STEP 2.** Take the second maths subject in a summer semester via the Community Access Program (CAP), free of charge

**STEP 3.** Apply for the Master of Engineering or Master of Engineering (with Business). You will need a 65% average in your Bachelor of Commerce.

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| or full fee paying place for an international student |
| Students who enrol in the Bachelor of Commerce/Master of Engineering Graduate Degree Package do not need to achieve a weighted average of 65%. |
WHICH KIND OF INFORMATION TECHNOLOGY IS FOR ME?

At Melbourne, there are many different ways to study IT. You can major in IT during your bachelor's degree, or advance your expertise at a masters level.

<table>
<thead>
<tr>
<th>I'M INTERESTED IN</th>
<th>MY CAREER GOALS</th>
<th>HOW TO GET THERE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designing programming platforms, and AI</td>
<td>Software engineer</td>
<td>Start with the Computing and Software Systems major in the Bachelor of Science, followed by the Master of Engineering (Software) or (Software with Business) to become an accredited engineer.</td>
</tr>
<tr>
<td>Protecting myself and the world in cyberspace</td>
<td>Cybersecurity expert</td>
<td>Start with the Computing and Software Systems major in the Bachelor of Science. Or, choose the Computing major in the Bachelor of Design. Then, complete the Master of Information Technology, specialising in Cybersecurity.</td>
</tr>
<tr>
<td>Front-end web design, programming and usability</td>
<td>User experience specialist</td>
<td>Choose the Computing major in the Bachelor of Design to focus on the technical aspects of web design, or choose the Digital Technologies major to focus on usability of digital design. Then, you could give your career a competitive edge with the Master of Information Technology, studying the Human-Computer Interaction specialisation, or the Master of Information Systems to focus on digital business.</td>
</tr>
<tr>
<td>Robotics and automation</td>
<td>Mechatronics or robotics engineer</td>
<td>Start with the Mechatronics Systems major in the Bachelor of Science, followed by the Master of Engineering (Mechatronics) to become an accredited engineer.</td>
</tr>
<tr>
<td>Mapping, smart cities and Internet of Things</td>
<td>Spatial engineer or geospatial analyst</td>
<td>Start with the Spatial Systems major in the Bachelor of Design or Science. To become an accredited engineer, then complete the Master of Engineering (Spatial). Or to advance your career in IT, study the Spatial specialisation in the Master of Information Technology.</td>
</tr>
<tr>
<td>Improving business processes with IT</td>
<td>Business analyst or consultant</td>
<td>Start with any bachelor degree, followed by the Master of Information Systems</td>
</tr>
<tr>
<td>Using data to drive decision making</td>
<td>Data scientist</td>
<td>Start with the Data Science major in the Bachelor of Science. To advance your career, continue your studies with the Master of Science (Data Science).</td>
</tr>
<tr>
<td>Technical computing, programming and algorithms</td>
<td>Computer scientist</td>
<td>Study the Computing and Information Systems major in the Bachelor of Science, followed by the Master of Science (Computer Science).</td>
</tr>
<tr>
<td>Using data-driven approaches to understand biological systems</td>
<td>Bioinformatician</td>
<td>Start with the Bachelor of Biomedicine, or the Bachelor of Science majoring in Biology, Bioengineering Systems, Data Science or Mathematics and Statistics. Then complete the Master of Science (Bioinformatics).</td>
</tr>
<tr>
<td>Improving health outcomes with IT</td>
<td>Health informatician</td>
<td>Start with a bachelor's degree at Melbourne, followed by the Master of Information Systems, specialising in Health.</td>
</tr>
</tbody>
</table>

For entry requirements to the Bachelor of Science or Design, please see page 7.
COMPLEMENT YOUR STUDIES WITH IT

Diploma in Informatics
Learn how to solve information-related problems by building skills in programming, designing online solutions and developing web applications. This could lead to further study in the Master of Information Technology, Master of Information Systems or Master of Engineering (Software) and (Software with Business).

Study IT as breadth
You can study IT as breadth in any of the undergraduate degrees offered at Melbourne. Breadth are subjects taken from outside your main area of study, enabling you to gain a wider understanding of the world and follow your career ambitions. IT breadth subjects include web information technologies, informatics, information security and privacy, information systems, computing, algorithms, artificial intelligence and game design.

- If you complete the corresponding major in your bachelor degree, you will be eligible to enter the 2 year Master of Engineering.
- You may be eligible for credit, depending on prior study.
- Please note that some breadth subjects require prerequisite subjects. Visit handbook.unimelb.edu.au for more information.

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“Mathew Blair, a Google software engineer, is a graduate of the University and says the emphasis on collaboration prepares students for working with clients in industry. "I had the opportunity to work in an industry placement as part of my final year project, where a group of 10 of us were able to operate like a small start-up."

Mathew Blair
Master of Engineering (Software)
Bachelor of Science (Computing and Software Systems major)
Software Engineer, Google
ABOUT COMPUTING
Make your mark across the domains of health, safety, community, business or education with your skills in building algorithms and apps. Computing involves the design, analysis and implementation of complex systems that support computer networks, databases and web services.


COMPUTING MAJOR
Want to develop strong capabilities in programming and digital material development? In the Computing major, you’ll develop technical skills in media computation, data manipulation and visualisation, interaction design and usability, computer networks, databases and web services.
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. You’ll explore the steps to delivering a quality IT product, as you design, implement and test an IT system in your final year project.

GRADUATE STUDY OPTIONS
Become an accredited software engineer with the Master of Engineering (Software) or (Software with Business). Or, pursue a career in computer science research with the Master of Computer Science.

YOUR CAREER
Build a career as an app developer, data analyst, digital copywriter, games developer, IT consultant and more.

STUDY THE COMPUTING MAJOR THROUGH THE BACHELOR OF DESIGN

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester 1</th>
<th>Media Computation</th>
<th>Calculus 2</th>
<th>Design elective</th>
<th>Breadth</th>
</tr>
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<tr>
<td></td>
<td>Semester 2</td>
<td>Foundations of Algorithms</td>
<td>Linear Algebra</td>
<td>Design elective</td>
<td>Breadth</td>
</tr>
<tr>
<td>Year 2</td>
<td>Semester 1</td>
<td>Design of Algorithms</td>
<td>Elements of Data Processing</td>
<td>Design elective</td>
<td>Breadth</td>
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<tr>
<td></td>
<td>Semester 2</td>
<td>Database Systems</td>
<td>Design elective</td>
<td>Design elective</td>
<td>Breadth</td>
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<tr>
<td>Year 3</td>
<td>Semester 1</td>
<td>Web Information Technologies</td>
<td>Computer Systems</td>
<td>Design elective</td>
<td>Breadth</td>
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<tr>
<td></td>
<td>Semester 2</td>
<td>Graphics and Interaction</td>
<td>IT Project</td>
<td>Design elective</td>
<td>Breadth</td>
</tr>
</tbody>
</table>

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.

Students who complete the Computing major in the Bachelor of Design will be eligible for the 2.5 year (237.5 point) Master of Engineering (Software) or (Software with Business) with Business.
ABOUT DATA SCIENCE

Over the past decade there has been an explosion in the amount of data captured from mobile phones, the internet, sensors and instruments. Capturing this data is big business, but how do we make sense of it all?

DATA SCIENCE MAJOR

Develop a strong foundation in the statistical aspects of data analysis (including data collection, data mining, modelling and inference) and the principles of computer science (including algorithms, data structures, data management and machine learning).
STUDENT EXPERIENCE
As a data science student, you’ll learn to integrate and apply statistical and computational principles to solve real-world problems with large-scale data science.

GRADUATE STUDY OPTIONS
Want to advance your skills in data science? Take the next step in your career with the Master of Data Science. Combine statistics and computer science to interpret big data.

YOUR CAREER
You could work as a data scientist or business intelligence analyst in a broad range of sectors, including government, business, sports, academia and more.

STUDY THE DATA SCIENCE MAJOR THROUGH THE BACHELOR OF SCIENCE

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Foundations of Computing</td>
<td>Calculus 2</td>
<td>Science elective</td>
<td>Breadth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foundations of Algorithms</td>
<td>Linear Algebra</td>
<td>Science elective</td>
<td>Breadth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Elements of Data Processing</td>
<td>Probability</td>
<td>Science elective</td>
<td>Breadth</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Statistics</td>
<td>Science elective</td>
<td>Science elective</td>
<td>Breadth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Linear Statistical Models</td>
<td>Machine Learning</td>
<td>Science elective</td>
<td>Breadth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Modern Applied Statistics</td>
<td>Applied Data Science</td>
<td>Science elective</td>
<td>Breadth</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Core Subject  | Breadth subject  | Elective subject

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.
“My dream project would be to create world-changing app or website. We have apps to check the weather, listen to infinite amounts of music and change the way we perceive the world. It would be incredible to create something that similarly changes the way we go about our daily lives.”

Charles Rosanove
Bachelor of Design (Digital Technologies major)
STUDENT EXPERIENCE
Throughout your degree, you’ll have the opportunity to work on a variety of app design projects, from an app that recommends nearby restaurants or lets you see what you’d look like with different hairstyles! In your final year you’ll develop a technology innovation proposal and learn to build a supporting business case. Your proposal will focus on a new interactive technology, or a new way to apply an existing one.

GRADUATE STUDY OPTIONS
Gain accreditation with the Australian Computer Society with the Master of Information Technology, where you can choose to specialise in Human-Computer Interaction, or advance your career in digital business with the Master of Information Systems.

YOUR CAREER
Apply your design expertise as an account manager, digital strategist, mobile app designer, multimedia programmer, search engine optimiser, UX designer, social media developer or web designer.

STUDY THE DIGITAL TECHNOLOGIES MAJOR THROUGH THE BACHELOR OF DESIGN

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Foundations of Design: Representation</td>
<td>Media Computation</td>
</tr>
<tr>
<td>Year 2</td>
<td>Foundations of Algorithms</td>
<td>Fundamentals of Interaction Design</td>
</tr>
<tr>
<td>Year 2</td>
<td>Elements of Data Processing</td>
<td>Design elective</td>
</tr>
<tr>
<td>Year 2</td>
<td>Database Systems</td>
<td>Usability Evaluation Methods</td>
</tr>
<tr>
<td>Year 3</td>
<td>Web Information Technologies</td>
<td>Game Design</td>
</tr>
<tr>
<td>Year 3</td>
<td>Capstone: Interactive Technology Project</td>
<td>Design Elective</td>
</tr>
</tbody>
</table>

Core Subject | Breadth subject | Elective subject

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.
A GLOBALLY CONNECTED ENGINEERING AND IT NETWORK

POPULAR EXCHANGE DESTINATIONS FOR ENGINEERING & IT STUDENTS

North America:
University of Illinois at Urbana Champaign (USA)
McGill University (Canada)
University of British Colombia (Canada)
University of Texas at Austin (USA)
New York University (USA)
Carnegie Mellon University (USA)

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

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

For a full list of institutions, visit programs.mobility.unimelb.edu.au/index.cfm
OUR ALUMNI: EXPAND YOUR OPPORTUNITIES BY JOINING A GLOBAL NETWORK OF OVER 30,000 ALUMNI WORKING ALL OVER THE WORLD.

North America:
» Bahamas
» Canada
» Costa Rica
» Guatemala
» Jamaica
» Mexico
» United States
» West Indies

Europe:
» Austria
» Belarus
» Belgium
» Cyprus
» Denmark
» Estonia
» France
» Germany
» Greece
» Hungary
» Iceland
» Ireland
» Italy
» Lebanon
» Luxembourg
» Macedonia
» Malta
» Netherlands
» Norway
» Scotland
» Serbia
» Sweden
» Turkey
» Ukraine
» United Kingdom

Asia:
» Afghanistan
» Azerbaijan
» Bahrain
» Bangladesh
» Bhutan
» Brunei
» Cambodia
» China
» India
» Indonesia
» Iran
» Japan
» Kazakhstan
» Korea
» Kuwait
» Laos
» Macau
» Malaysia
» Maldives
» Myanmar
» Mongolia
» Nepal
» Oman
» Pakistan
» Philippines
» Qatar
» Singapore
» Sri Lanka
» Thailand
» United Arab Emirates
» Vietnam

South America
» Argentina
» Bolivia
» Brazil
» Chile
» Colombia
» Ecuador
» Paraguay
» Peru

Africa
» Botswana
» Egypt
» Ethiopia
» Ghana
» Kenya
» Lesotho
» Libya
» Mauritius
» Mozambique
» Namibia
» Nigeria
» Seychelles

South Africa
» Swaziland
» Tanzania
» Uganda
» Zambia
» Zimbabwe

Australasia
» Australia
» Fiji
» New Caledonia
» Papua New Guinea
» Samoa

Antarctica

OUR EXCHANGE PARTNER INSTITUTIONS
180 EXCHANGE PARTNER INSTITUTIONS ACROSS 39 COUNTRIES

NETWORK OF
32,529 ALUMNI IN MORE THAN 100 COUNTRIES
Australia’s digital-driven economy is growing, and a workforce equipped with engineering and IT skills is essential to making the most of this opportunity. Around the world, employers are looking to fill valuable STEM roles with people who have the right combination of technical and professional skills, including business and communication skills.

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

No matter which engineering or IT specialisation you choose, you’ll have the opportunity to make an impact on global challenges and future-proof your career – wherever that may take you.

Alastair Paterson
Bachelor of Commerce
Master of Engineering (Software)
Development Ops Delivery Engineer, recetech

BACHELOR DEGREE
3 years

MASTER OF ENGINEERING
2 years

GRADUATE OPPORTUNITIES

ACCENTURE
ANZ
DELOITTE
GOOGLE
IBM
MICROSOFT
PALANTIR
PLANET INNOVATION
TELSTRA
Danielle Grant
Bachelor of Science (Electrical Systems major)
Master of Engineering (Electrical with Business)
IEA Reliability Engineer, ExxonMobil
STUDENT EXPERIENCE

ENGINEERING & IT CLUBS
Join our community of future engineers with the Pre-ENG Club! Access course information through personalised consultations with staff, learn about engineering careers, attend site tours, network with industry and receive the latest engineering & IT news at Melbourne.

Other student clubs bring together people passionate about robotics, biomedical engineering, computing and information systems and more:
- Engineering Students’ Club (MUESC)
- Engineers Without Borders (EWB)
- MUR Motorsports
- Robogals
- 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 space and access to a network of mentors and investors. MAP is Australia’s leading entrepreneurship program, and has been ranked 13th entrepreneurial program in the world by the leading Swedish-based UBI Index.

STUDY OVERSEAS
Want to combine travel and study? Benefit from scholarships, bursaries and other funding options to help you complete part of your course overseas, either in short-term or semester-long programs.

OTHER OPPORTUNITIES
- **Skill building:** give your career a headstart with skill-building workshops, industry events and screened job listings
- **Melbourne Space Program:** aiming to launch a student-built satellite from scratch, the Melbourne Space Program aims to put Australian students at the forefront of the space industry and bridge the gap between curriculum and career.
- **Mentoring:** connect with engineering and IT masters students or alumni, or industry professionals working in STEM

Women in Science and Engineering (WISE)
Want to connect with a community of female science and engineering students? As a member of WISE, you’ll benefit from regular networking events, access career advice tailored to female students, attend industry panels and workshops, and take part in site visits.

Computing and Information Systems Society (CISSA)
Connect with industry and potential employers, meet like-minded students and learn about career opportunities in IT. With CISSA, you could take part in workshops and programming competitions like CodeBrew, 48 hour hackathon where students from a broad variety of degrees work in teams to design and implement a technical solution to a given problem.
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.

AMAZING SPAGHETTI MACHINE
Put your science, engineering and maths skills to the test in this annual contest, where you’ll build an elaborate machine over five months that performs a simple task.

Designed for: Year 10s

PROGRAMMING CHALLENGE FOR GIRLS (PC4G)
Take part in a series of workshops and learn about computer programming with ‘ALICE’, and test your skills in the PC4G Finale.

Designed for: Year 9 girls

HANDS ON ENGINEERING & IT
Join us on the school holidays and take part in interactive, hands-on activities to learn about engineering and technology concepts and issues.

Designed for: Year 10s

GIRL POWER IN STEM
Learn about careers in STEM and connect with like-minded high school students. Girls in STEM is a four year program, where you’ll join us for a camp at the University of Melbourne, undertake work experience and meet with mentors.

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

CODEMASTERS AND DESIGNMASTERS
Solve problems with computer programming or use design-thinking to come up with innovative solutions to improve our society – available both on-campus and online.

Designed for: Years 7-12

VCE ALGORITHMICS
Study IT in high school with Algorithmics, a computing subject that is taught in collaboration with participating secondary schools. Focusing on ‘algorithmic thinking’, you’ll explore how information can be systematically represented, processed and implemented in a computer program.

Designed for: Year 12s

eng.unimelb.edu.au/engage/schools

GET INVOLVED

Engineers Without Borders (EWB)
Make a difference globally with humanitarian engineering. Through our partnership with Engineers Without Borders, you’ll have the opportunity to:

» Contribute to the world’s most disadvantaged communities
» Design solutions to real-world problems or collaborate on sustainable projects
» Inspire high school students about sustainable engineering and community development
» Connect with industry partners, attend industry events or find a project mentor
» Access work and internship opportunities
FEES, SCHOLARSHIPS AND APPLICATIONS

HOW TO APPLY

<table>
<thead>
<tr>
<th>What type of student are you?</th>
<th>Apply via</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>Victorian Tertiary Admissions Centre (VTAC)</td>
<td>vtac.edu.au</td>
</tr>
<tr>
<td>International, completing year 12 or another undergraduate course in Australia</td>
<td>Victorian Tertiary Admissions Centre (VTAC)</td>
<td>vtac.edu.au</td>
</tr>
<tr>
<td>International, studying outside Australia</td>
<td>Apply directly to the University or through one of our representatives</td>
<td>futurestudents.unimelb.edu.au/admissions/applications/ug-int</td>
</tr>
</tbody>
</table>

HOW TO APPLY FOR A MASTERS IN ENGINEERING OR IT

Submit your application online in the final year of your undergraduate study.

Ensure you have:
- met the course prerequisites
- achieved a minimum weighted average of 65%

Students with a Graduate Degree Package do not need to apply for the masters degree.

GUARANTEED ENTRY

If you complete your undergraduate degree at the University of Melbourne and achieve a weighted average mark 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 and Master of Information Technology, regardless of your ATAR.

GRADUATE ACCESS

Provides access to local applications with personal circumstances that have sustained an adverse effect on their academic achievement at an undergraduate level, or who are members of a specified group known to be underrepresented in higher education, such as women in engineering or IT.

gradaccess.unimelb.edu.au

SCHOLARSHIPS

The Melbourne School of Engineering and the University of Melbourne offers a range of generous scholarships. Students are considered for relevant scholarships at the time of their course offer, and no separate application is required.

scholarships.unimelb.edu.au

COMMONWEALTH SUPPORTED PLACES (CSPs)

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.


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

Graduate Degree Packages are only available for applications via VTAC, for entry in February 2019.
FEES

Indicative 2019 fees for first year

<table>
<thead>
<tr>
<th>Course</th>
<th>Domestic (CSP)</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Biomedicine</td>
<td>$9,185</td>
<td>$40,216-42,912</td>
</tr>
<tr>
<td>Bachelor of Commerce</td>
<td>$9,185</td>
<td>$40,216-42,912</td>
</tr>
<tr>
<td>Bachelor of Design</td>
<td>$9,185</td>
<td>$32,784-42,600</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>$9,185</td>
<td>$39,628-43,520</td>
</tr>
<tr>
<td>Master of Engineering</td>
<td>$9,185</td>
<td>$41,344</td>
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<tr>
<td>Master of Information Systems</td>
<td>$9,185</td>
<td>$41,344</td>
</tr>
<tr>
<td>Master of Information Technology</td>
<td>$9,185</td>
<td>$41,344</td>
</tr>
</tbody>
</table>

futurestudents.unimelb.edu.au/admissions/fees


2. For entry into the 3 year Master of Engineering or Master of Engineering (with Business)

3. Provided the maths and science entry requirements are met.

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

5. Australian Fee (AF) places are $33,024 per annum.