THE UNIVERSITY OF SYDNEY

The University of Sydney

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Engineering and Information Technologies

Undergraduate guide 2018

Engineering and Information Technologies

Undergraduate guide 2018

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THE UNIVERSITY OF SYDNEY

Join us

Courses

How to apply

THE SYDNEY UNDERGRADUATE EXPERIENCE

The world is changing, and university education needs to change too.

We've reimagined the Sydney Undergraduate Experience – the way we teach and the way you'll learn – to prepare you for a future full of possibilities.

YOUR DEGREE

We offer unparalleled choice

At Sydney you'll have access to a breadth and depth of excellence in disciplines and professional fields that is unparalleled in Australia.

Broaden your skills

You can widen your skills in entrepreneurial thinking, persuasive communication, project management and ethical reasoning by taking short, on-demand and workshop-supported courses in our Open Learning Environment.

Follow your interests. All of them.

We have created a new level of flexibility with a shared pool of majors and minors so you can expand your education with a second field of study.

For instance, you will be able to enjoy studying science without having to give up your interest in history; combine your major in marketing with the study of digital cultures; or learn both engineering and a language.

YOUR EXPERIENCE

Academic rigour

Gain a deep understanding of your chosen disciplines of study and learn from those who are leaders in their fields.

Global perspectives

Set yourself up to go anywhere in the world by gaining the skills and understanding to work effectively across cultural boundaries. Go on exchange, study a language or undertake projects in distinctive cultural settings here and overseas.

Cross-disciplinary learning

Study across or work with other disciplines to build your skills and tackle some of the most complex challenges of our time.

Real-world projects

Bridge the gap between theory and application by working on real-world industry, community, research and entrepreneurship projects.

YOUR FUTURE

You will leave university with the confidence and ability to think critically, collaborate productively, and influence the world.

sydney.edu.au/ug-experience

WHY CHOOSE SYDNEY?

Studying engineering, computing or project management at the University of Sydney will provide you with the highest technical skills combined with practical, future-focused learning.

You will have the opportunity to apply your developing expertise to creatively tackle authentic problems in industry, community, research and innovation settings. Our strong industry connections will help you to build your career network through internships, placements and consultancy projects.

Our engineering degrees are accredited by Engineers Australia, and you will graduate with globally recognised qualifications, giving you more opportunities to work anywhere in the world.

If you are a high achiever looking to develop your leadership skills and network, our Leadership Scholarship is one of Australia's most valuable programs (see page 47 for more details).

1st in Australia and ranked **4th** in the world for graduate employability [1]

Ranked 1st in Australia and **28th globally** for research innovation [2]

#1 for student experience in Australia [3]

Top 3 universities in Australia for engineering and technology [4]

$8 million in scholarships offered every year [5]

Connect with a network of more than **1200** engineering, technology and government organisations

More than **double the national average** of women are studying engineering, computing and project management with us

Largest biomedical engineering program of its kind in the southern hemisphere

Connect with a network of some **25,550** engineering, IT and project management alumni

1. QS Graduate Employability Rankings 2017
2. Thomson Reuters' Top 75: Asia's Most Innovative Universities 2016
3. National Union of Students Quality Survey 2010, 2011, 2013, 2015
4. QS World University Rankings 2016-17
5. Total for scholarships offered across all degrees in the Faculty of Engineering and Information Technologies

LIFE IN ENGINEERING AND IT

"Throwing yourself into student societies is one of the best ways to make the most of your experience at university. Engineering is a warm and welcoming environment for absolutely anyone and it's our societies that lead the charge."

James Broe
Engineering Honours (Mechatronic)/Science
President, Sydney University Mechatronics Organisation (SUMO)

University life is more than studying hard and attending class. Our clubs and societies help you make the most of your university experience. They prepare you for the workforce by providing you with networking opportunities and allowing you to develop your leadership and communication skills.

Whatever course you choose to study, there is a related society for you to join. You will find plenty of people who share your interests and can introduce you to new ones. To find a society suits you, go to:

- sydney.edu.au/engineering/socs

In your first semester at the University of Sydney you'll have the opportunity to go on a camp for first-year students with your chosen student society. A fun few days away is the perfect way to transition from high school and get to know your new classmates.

There are currently two societies designed to empower and encourage women in engineering, both academically and personally: Sydney Women in Engineering and Sydney Women in Aerospace Engineering. These groups offer support and opportunities to network with your fellow female students and industry alumni.

There is also a range of sporting, social and other clubs that allow you to pursue your other interests. There's even a club for motorsport enthusiasts who construct and race a small, open-wheeled Formula SAE racing car.

There are loads of great eateries and cafes in and around the Engineering and IT precinct. You can then head to the nearby Sydney Uni Sports and Aquatic Centre and burn off some calories.

GLOBAL OPPORTUNITIES

At the University of Sydney every student has access to global opportunities to broaden their horizons.

Each year students from across the Faculty of Engineering and Information Technologies extend their learning in different locations around Australia and the world. Your opportunities include field trips, global professional placements, and short-term, semester and year-long exchanges with more than 300 partner universities worldwide.

Undertake part of your degree in China or Chile, Norway or New Zealand, Sweden or Spain, the US or UK. It's a great way to experience another culture as you learn.

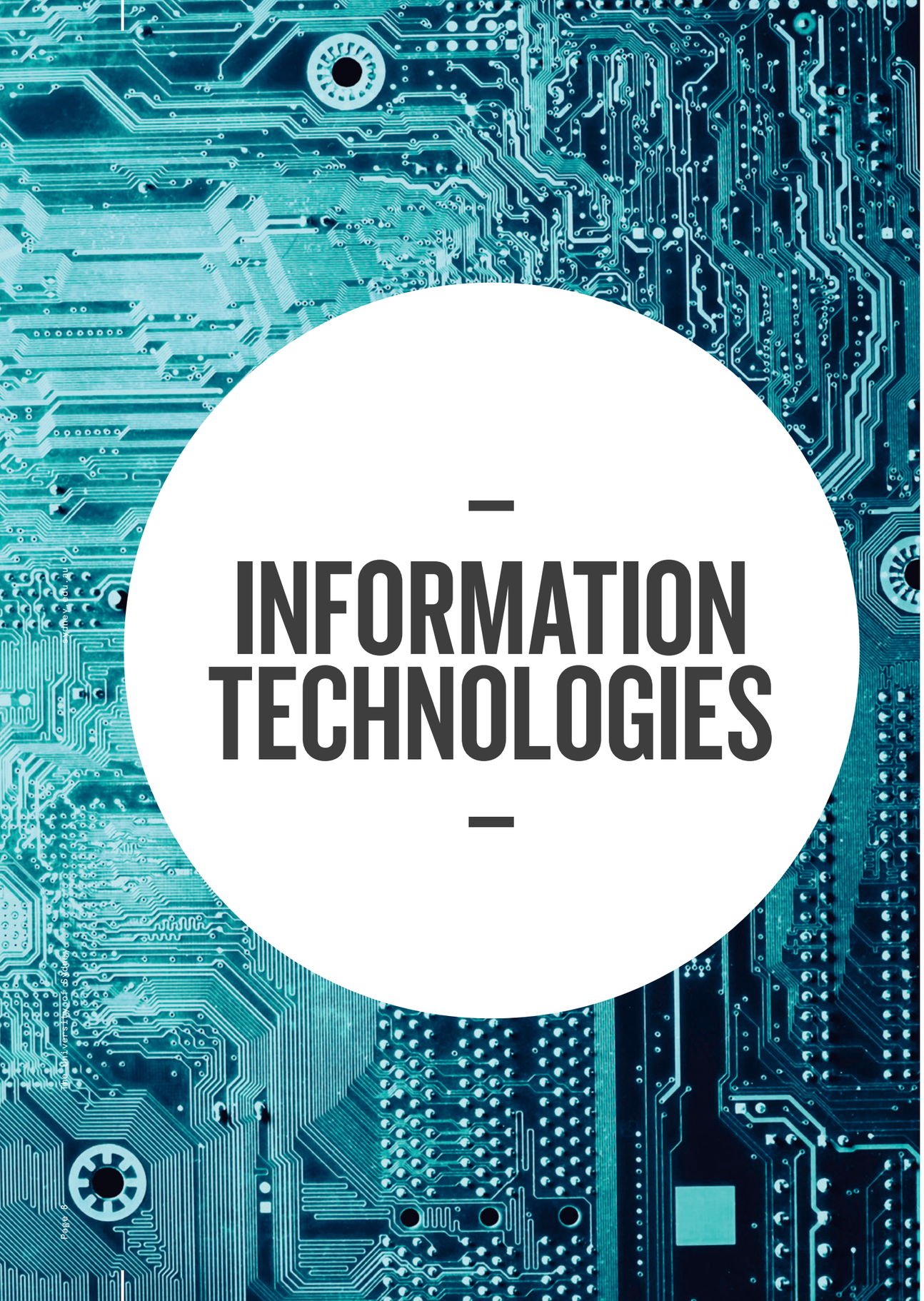
We've had students travel to India and Samoa as part of the Humanitarian Engineering major, and others who have undertaken six-month industry work placements in Saudi Arabia, Papua New Guinea and California, with NASA's Jet Propulsion Lab.

We offer support for your overseas experience through scholarships, grants and loans. Find out more about our study abroad and exchange programs:

- sydney.edu.au/scholarships/current/exchange

Read more about our exchange scholarships:

- sydney.edu.au/study/overseas-exchange



INFORMATION TECHNOLOGIES

BACHELOR OF ADVANCED COMPUTING

From smartphones, 3D printers and drones to transport networks, smart cities and the internet of things, most innovations need software to drive them. Computing and information systems help us gather and translate data that changes the way the world functions, from running a bank to the temperature of an operating theatre.

By studying computing, you'll develop the creativity, originality and problem-solving skills that employers across many sectors value most and which could directly impact millions of lives.

Benefit from innovation

The Bachelor of Advanced Computing is designed with your computing career in mind. It develops and connects practical and theoretical skills across computing industries.

Learn from leaders within many different specialties in computing, with the flexibility to combine your interest in computing with another passion – from music and languages to finance, food science and design.

A common first year introduces the core skills required to become an IT professional before you specialise in one of four majors. Your fourth year focuses on innovation, including a thesis project and study of advanced topics, and on completing an optional second major. See page 12 for details.

If you're keen to get into the workforce after three years, you have the option to graduate with a Bachelor of Computing.

Majors

Computer Science
Explore exciting new technologies and create fundamentally new solutions to complex challenges. You'll learn the key concepts of computing, the principles and techniques needed to solve tasks efficiently with computation, and how to express those solutions in software.

Information Systems
Design, implement and evaluate enterprise software systems to meet an organisation's needs. Rather than being about developing and enhancing the performance of computers, you'll be working with clients to make computer systems work within the broader socio-technical context.

Software Development
Develop the understanding and skills to reliably design and deliver high-quality software systems, and lead the next wave of technical innovation.

CAREER SNAPSHOT

Write software for organisations of all sizes, invent new types of code, provide consultancy on Information Communications Technology (ICT) decision-making or develop new ways to process large complex datasets.

–

Work in an established company or launch your own.

–

This career is a great choice for both creative and analytical minds.

–

See the direct positive impact of your work, potentially for millions of people around the world.

–

Flexible work hours and a dynamic work environment make for a good work–life balance.

–

To be successful, combine your technical knowledge and practical, hands-on experience with communication skills.

–

Enjoy global work opportunities, right from the first years of your career.

–

Graduate salaries for both men and women start at $53–57K per annum.^

^Australian Government Gradstats – Starting salaries 2015

Computational data science

Develop your mathematical, analytical and technical skills to create solutions that guide data-driven decision-making. The statistical, data management and machine learning skills you'll master can be applied across any industry or science.

Combine your passions with innovation

With one of Australia's most innovative computing courses you can complete two majors, combining your passion for computing with one of more than 100 cross-disciplinary majors as you cultivate specialist industry knowledge and computing expertise.

- Combine Software Development with Music and revolutionise sound production.
- Choose Information Systems and Geography and develop a better way to navigate the world.
- Combine Computer Science with Linguistics and make real-time translation a reality.
- Combine Computational Data Science with Genetics and Genomics and help fight antibiotic-resistant viruses.
- Choosing two computer majors such as Computational Data Science and Information Systems will help your business to better understand consumer behaviour.

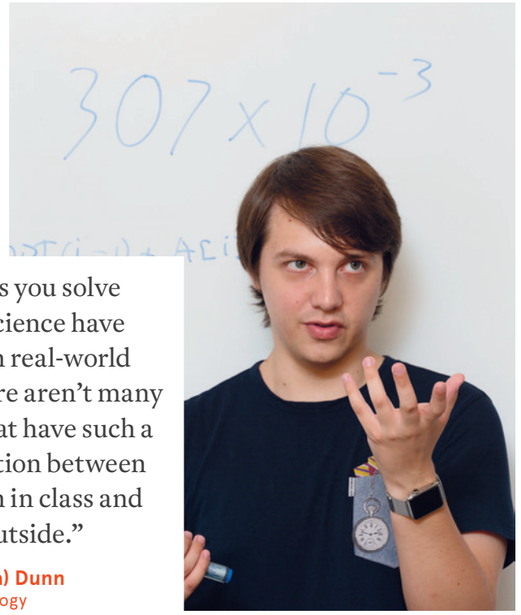
The options are endless! Here's what just one combination looks like.

Sample course structure: Bachelor of Advanced Computing, majoring in Computer Science and Design

Year 1
Degree core: Computing 1A and 1B – Professionalism and Platforms
Computer Science major and degree core: Programming 1 and 2
Degree core: IT Maths 1 and 2
Degree core: Critical Thinking with Data*
Degree core: Intro Computer Systems
Degree core: Informatics: Data and Computation
Year 2
Computer Science major and degree core: Data Structures and Algorithms
Degree core: Data and Information Management*
Degree core: Software Processes
Degree core: Computing 2: Security and Usability*
Computer Science major: Algorithmic Design
Computer Science major: Logic and Formal Languages*
Design major: Principles of Design
Design major: Design Theory and Culture

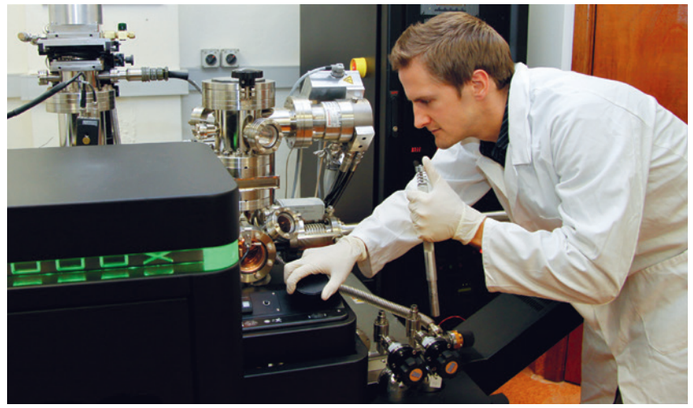
Year 3
Degree core: Computing 3 – Management*
Computer Science major: Programming Languages
Computer Science major: Distributed Systems
Computer Science major: Computer Science Project
Design major: Design Thinking
Design major: Visual Communication
Design major: Web and Interface Design
Elective: Data Science – Scale and Data Diversity
Year 4
Degree core: Thesis A and B
Degree core: Computing 4 – Innovation*
Design major: Design Innovation Studio
Design major: Data Design Studio
Design major: Information Design and Visual Storytelling
Open Learning Environment: Business Entrepreneurship*,
STEM Communications*, Understanding Creativity*
Elective: Graphics and Multimedia
Elective: Experience and Service Design

* These units are just some of the many electives available to students. Units are indicative only.



"The problems you solve in computer science have applications in real-world scenarios; there aren't many other fields that have such a direct connection between what you learn in class and what you do outside."

Konstantin (Kosta) Dunn
Information Technology



Experience beyond the lecture hall

Programs to foster entrepreneurship

Combine your new-found computing skills with your entrepreneurial drive to launch something exciting. A recent survey by Startup Muster revealed more Australian start-up founders studied at the University of Sydney than any other Australian university. We support you through programs such as the Sydney Accelerator Network (SAN:IT) and Incubate, to help get your ideas up and running.

Annual SydneyHack

Working with the Data Analytics Centre (DAC) and the NSW Government, Sydney IT students work in teams to come up with data-driven and evidence-based solutions to a current issue. For SydneyHack 2016 teams undertook an intensive 48-hour hackathon to address the issue of pedestrian safety, where fatalities represent as much as one third of all road deaths in metropolitan areas. As well as having fun and getting great hands-on experience, your team will be in the running for cash prizes and unique internship opportunities.

Hands-on industry projects

As a final-year student, you'll work with one of our 1200 industry partners on an actual business challenge. This capstone project will spark your passion for innovation, improve your teamwork and communication skills, and give you the experience and networking opportunities to improve your career prospects. If you're thinking of a research-based computing career, you can then turn your innovative ideas into credit for a major thesis.

"Having a specialisation in other fields and combining it with programming and data science will produce innovative businesses and projects we couldn't imagine or comprehend today."

Tinlok (Tiny) Pang
Information Technology/Science graduate
Senior Data Scientist, Canva

"Whether I decide to pursue a career as a developer, consultant or researcher, I know that I will be well equipped to meet any challenge thrown at me."

Deanna Arora
Information Technology

SHARED POOL OF MAJORS AND MINORS

The shared pool of majors allows you to explore a wide range of study areas within your Bachelor of Advanced Computing degree as you acquire multidisciplinary knowledge and critical analytical skills that complement your primary computing major.

Choose your second major from any of the majors listed to combine your passion for computing with another area of interest. Pair your computer programming skills with marketing, for example, and design customer-focused applications. Choose software development and geography and be equipped to build geographic information systems. Or further your love of foreign languages or cultural studies to expand your career opportunities abroad. The possibilities are endless!

Combine your primary major with a major or minor in one of the areas below.

Architecture and interaction design

- Design

Arts and social sciences

- Agricultural and Resource Economics
- American Studies
- Ancient Greek
- Ancient History
- Anthropology
- Arabic Language and Cultures
- Archaeology
- Art History
- Asian Studies
- Biblical Studies and Classical Hebrew
- Chinese Studies
- Cultural Studies
- Digital Cultures
- Economic Policy
- Economics
- English
- European Studies
- Film Studies
- French and Francophone Studies
- Gender Studies
- Germanic Studies
- Hebrew (Modern)
- History
- Indigenous Studies
- Indonesian Studies
- International and Comparative Literary Studies
- International Relations
- Italian Studies
- Japanese Studies
- Jewish Civilisation, Thought and Culture
- Korean Studies
- Latin
- Linguistics
- Modern Greek
- Philosophy
- Political Economy
- Politics
- Socio-legal Studies
- Sociology
- Spanish and Latin American Studies
- Studies in Religion
- Theatre and Performance Studies
- Visual Arts

Business

- Accounting
- Banking
- Business Analytics
- Business Information Systems
- Business Law
- Finance
- Industrial Relations and Human Resource Management
- International Business
- Management
- Marketing

Education and social work

- Education

Engineering and information technology

- Computer Science
- Information Systems
- Project Management
- Software Development

Health, medicine and dentistry

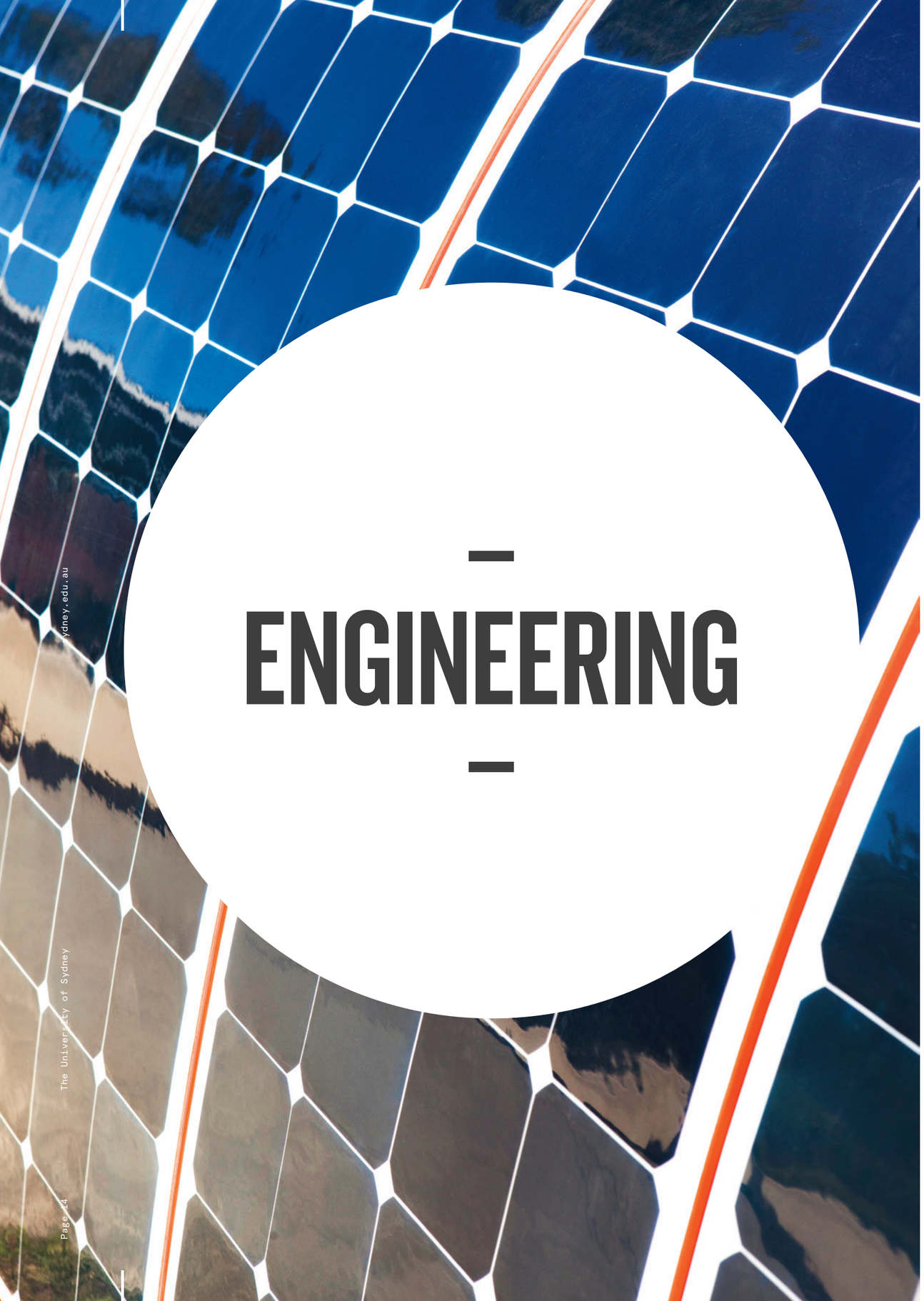
- Anatomy and Histology
- Applied Medical Science
- Health
- Hearing and Speech
- Immunology and Pathology
- Infectious Diseases
- Neuroscience
- Pharmacology
- Physiology

Music

- Music

Science, agriculture, environment and veterinary science

- Animal Health, Disease and Welfare
- Animal Production
- Behavioural Sciences
- Biochemistry and Molecular Biology
- Biology
- Cell and Developmental Biology
- Chemistry
- Data Science
- Ecology and Evolutionary Biology
- Environmental Studies
- Financial Mathematics and Statistics
- Food Science
- Genetics and Genomics
- Geography
- Geology and Geophysics
- History and Philosophy of Science
- Marine Sciences
- Mathematics
- Medicinal Chemistry
- Microbiology
- Nutrition Science
- Physics
- Plant Production
- Quantitative Life Sciences
- Soil Sciences and Hydrology
- Statistics



ENGINEERING

BACHELOR OF ENGINEERING HONOURS (AERONAUTICAL)

Aeronautical engineering is the design, production, testing and maintenance of aircraft, aerospace vehicles and their systems. This includes conventional fixed-wing aircraft and helicopters, missiles, rockets and spacecraft, as well as drones.

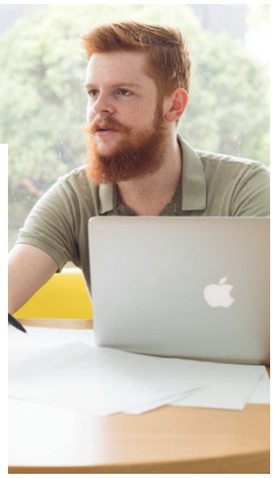
With the growth in commercial air and space travel and the demand for high-speed travel on the rise, the opportunity to revolutionise the next generation of aircraft and become a leader in the aerospace industry is all yours.

Let your ambitions soar

Our Bachelor of Engineering Honours (Aeronautical) will give you an in-depth understanding of the design and operation of aircraft and aerospace systems in the Earth's atmosphere and in space. Combining hands-on experiential learning and industry experience, this program prepares you for the aerospace industry's next evolution.

You will develop an understanding of flight vehicle design, including aerodynamics, lightweight structures, flight mechanics and control, propulsion, and aircraft design.

During your degree, you will construct a light aircraft and learn about aeronautical design, operations and regulations.



"I chose to study at Sydney because of the School of Aerospace, Mechanical and Mechatronic Engineering's state-of-the-art facilities and equipment. There are the motion and static flight simulators, two wind tunnels, the unmanned aerial systems lab and Jabiru – the two-seater aircraft that students have the chance to assemble."

Jeremy Cox
Engineering Aeronautical (Space)/Science

CAREER SNAPSHOT

Design, build and fly aircraft, or even work in the space industry.

Take your skills into the defence industry, specialising in military aircraft, rockets, satellites, and helicopters.

Improve flight safety, fuel efficiency and operational systems, looking into the environmental impact of air travel.

Design, build and test new designs for small unmanned aerial vehicles (UAVs), also known as drones.

As an aerodynamicist or design engineer, you can design and develop products in fields such as formula and endurance racing, or the automotive industry.

Graduate salaries start at $60–63K per annum.^

As aircraft are the same all over the globe and your degree is accredited internationally, you can work anywhere in the world.

Work for renowned companies like Boeing, Airbus and Qantas, or start your own business.

^Australian Government Gradstats – Starting salaries 2015

Majors

There are more than 15 engineering majors to choose from. The major that best aligns with this stream is Space Engineering.

Space Engineering

The Space Engineering major at Sydney is the only program of its kind offered in Australia. It looks into the world of orbital mechanics, space vehicles, space avionics and robotics.

Through this major you could become a space engineer within the aerospace, defence, environmental or research industries, designing and building satellite subsystems, robotic programs and interplanetary space systems.

Sample course structure: Bachelor of Engineering Honours (Aeronautical)

Year 1
Degree core: Linear Algebra
Degree core: Calculus of One Variable
Degree core: Statistics
Degree core: Multivariable Calculus and Modelling
Degree core: Integrated Engineering 1
Degree core: Introduction to Aircraft Construction and Design
Degree core: Engineering Computing
Degree core: Introduction to Aerospace Engineering
Degree core: Engineering Mechanics
Degree core: Materials 1
Year 2
Degree core: Integrated Engineering 2
Degree core: Instrumentation
Degree core: Engineering Dynamics
Degree core: Fluid Mechanics 1
Degree core: Mechanics of Solids 1
Degree core: Mechanical Design 1
Degree core: Thermal Engineering 1
Degree core: Aircraft Performance and Operations
Elective: Engineering Analysis*
Year 3
Degree core: Integrated Engineering 3
Degree core: System Dynamics and Control
Degree core: Aerospace Design 1
Degree core: Aerospace Structures 1
Degree core: Propulsion
Degree core: Flight Mechanics 1
Degree core: Aerodynamics 1
Elective: Engineering Methods*
Elective: Aerospace Design 2*
Year 4
Practical Experience
Degree core: Thesis A
Degree core: Integrated Engineering 4
Degree core: Thesis B
Degree core: Aerospace Design 3
Elective: Aerodynamics 2*
Elective: Vibration and Acoustics*
Elective: Flight Mechanics 2*
Elective: Engineering Analysis*

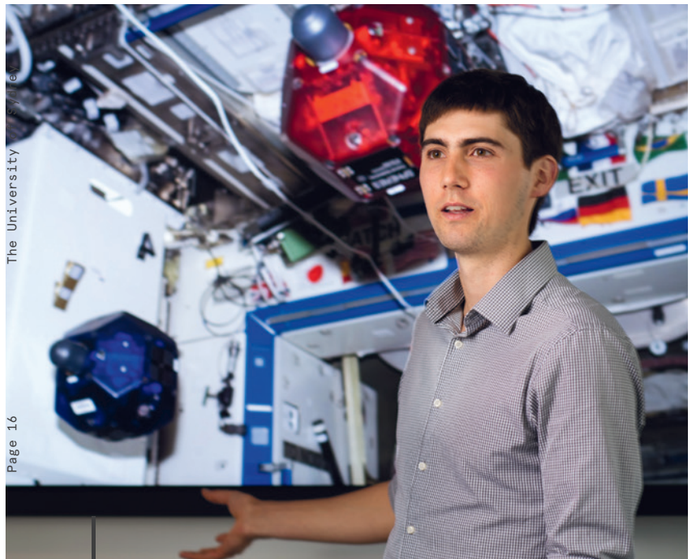
* These electives are some of the many electives available to students. Units are indicative only.

Gain experience beyond the lecture hall

From first year, undergraduate students studying aeronautical engineering have many unique opportunities to enhance their aerospace engineering training. This includes building a two-person single-engine aircraft where students design and assemble the airplane components, as well as working with flight simulators, flight operations training, and developing and operating drones.

"The airline industry is always changing and evolving, and makes for an exciting career. Currently I'm working on a new and innovative flight planning system that will improve the way flight plans are calculated. When it launches, it will be the most advanced of its kind in the world."

David Boyd
Engineering Honours (Aeronautical)/Science (Computer Science and Mathematics) graduate
Fleet Performance Engineer, Qantas



"I lead a team of students from the faculty who mentor high school students competing in the international Zero Robotics competition. These mentors had the amazing experience of helping their students to program robots that live on the International Space Station."

Ben Morrell
Aerospace PhD candidate

"My main area of interest is space exploration and during my degree I was lucky enough to learn about the orbital mechanics required to put a rocket into orbit. This was an extraordinary experience!"

Caroline Hamilton Smith
Engineering Honours (Aeronautical)

BACHELOR OF ENGINEERING HONOURS (BIOMEDICAL)

Cochlear implants, heart pacemakers, MRI^ scanners, hip and knee replacement, laser surgery and bionic organs – these almost-everyday innovations, once thought of as impossible, were made a reality by biomedical engineering.

Biomedical engineering is one of the fastest-growing branches of engineering and it's easy to see why. Combining a wide range of engineering disciplines with the life sciences of medicine and human biology, biomedical engineers are the technologists whose work underpins the health system, working with doctors and medical professionals to make a real difference in people's lives.

Biomedical engineers design and manufacture implantable medical devices, including orthopaedic, cardiovascular and drug delivery systems. Bionic organs, robotic limbs, heart assist pumps and heart valves delivered in non-invasive day-surgery procedures are just some of the latest innovations that biomedical engineers have recently brought to the world.

What sets our Bachelor of Engineering (Biomedical) apart

By studying at the University of Sydney, your biomedical engineering training starts from day one as an undergraduate. Unlike the degrees in other universities, you'll finish your biomedical engineering degree and be ready to work in just four years. You will learn from and collaborate with leading researchers across many disciplines. The course combines mechanical, mechatronic, electronic, chemical and materials engineering, allowing you to specialise in the areas that you like the most.

You will be able to contribute to innovative discoveries within fields such as biomedical technology, orthopaedic or tissue engineering, bioelectronics and the computational simulation of biomedical systems.

Throughout this four-year degree you can specialise in a wide range of biomedical engineering electives, across the spectrum of advanced biomedical computing to e-medicine, biomechatronics, neuromodulation, advanced bioelectronics, biotechnology, biophysics, membrane science and biomedical product development.

In your fourth year you will complete an honours thesis, which involves designing, manufacturing and demonstrating an innovative biomedical engineering system, in collaboration with industry specialists and hospitals. A 12-week internship will give you invaluable first-hand experience within the biomedical field.

Majors

Completing a major in a related engineering discipline is not a requirement for graduation, but it is an opportunity that many students like to take up. There are more than 15 engineering majors to choose from.

The majors that best align with this stream are Chemical Engineering, Electrical Engineering, Humanitarian Engineering, Information Technology, Mechanical Engineering and Mechatronic Engineering.

As an alternative to doing a major, you can choose to do up to 10 Biomedical Specialist electives. There are 25 electives available, 20 of which are at the master's level. These specialist electives take you to the forefront of innovation and include units such as Biomedical Product Development, Advanced Bioelectronics and Experimental Robotics. Even if you choose a major, you can still select two biomedical specialist electives.

"Personalised medicine, where therapeutics are targeted depending on your genetic make-up, will start becoming more widespread in the next five years – and biomedical engineers will be helping this become a reality."

Dr Rachel Thomas
Engineering (Biomedical)/Science graduate
British Medical Association's Young Author of the Year 2016

Sample course structure: Bachelor of Engineering Honours (Biomedical) majoring in Information Technology

Year 1
Degree core: Differential Calculus
Degree core: Integral Calculus and Modelling
Degree core: Linear Algebra
Degree core: Statistics
Degree core: Biomedical Engineering 1A and 1B
Degree core: Engineering Mechanics
Degree core: Integrated Engineering 1
Degree core: Chemistry 1A
Degree core: Programming 1
Year 2
Degree core: Integrated Engineering 2
Degree core: Anatomy and Physiology for Engineers
Degree core: Biomedical Engineering 2
Degree core: Materials 1
Degree core: Fundamentals of Electrical and Electronic Engineering
Degree core: Signals and Systems
Information Technology Major: Operating Systems and Machine Principles
Information Technology Major: Algorithms and Complexity
Information Technology Major: Database Systems

Year 3
Degree core: Manufacturing Engineering
Degree core: Integrated Engineering 3
Degree core: Electronic Devices and Circuits
Degree core: Biomedical Design and Technology
Biomedical Stream Elective: Regulatory Affairs in the Medical Industry
Biomedical Stream Elective: Health System Data Standards and Analysis
Information Technology Major: Graphics and Multimedia
Information Technology Major: Human-Computer Interaction
Information Technology Major: Introduction to Artificial Intelligence
Year 4
Degree core: Integrated Engineering 4
Degree core: Thesis A and B
Practical Experience
Degree core: Tissue Engineering
Degree core: Biomechanics and Biomaterials
Degree core: Introduction to Biomechatronics
Biomedical Stream Elective: Fundamentals of Neuromodulation
Biomedical Stream Elective: Biomedical Product Development

* These electives are some of the many electives available to students. Units are indicative only.

^Magnetic Resonance Imaging
^^Graduate Opportunities (published by Graduate Careers Australia)

CAREER SNAPSHOT

Work with surgeons and technical staff in the public or private hospital systems; for an organisation that designs and manufactures medical devices; or as a part of a research team looking to solve a medical problem.

Combine your aptitude for engineering with a passion to help the sick and people with disabilities.

This career is perfect for people who like problem solving and investigating how things work in detail.

A career with growing demand. Emerging technologies can be applied to meet the health challenges of the future.

A recession-proof career. While people may spend less on cars, appliances, infrastructure and construction in hard times, healthcare is an essential service.

Equally popular with both men and women. In 2017, more than 50 percent of Sydney biomedical engineering students were women.

Graduate salaries for both men and women start at around $63K per annum.^^

Biomedical engineers can go on to study the graduate-entry Doctor of Medicine and Doctor of Dentistry, or undertake a Master of Health Technology Innovation or research postgraduate degree.

"I was able to spend the summer researching and developing a novel abdomen-powered 3D printed prosthetic hand with industry partners and the University. The project was rewarding as I had the freedom to be creative and it gave me insight into the challenges of translating academia into a commercially viable product."

Kristina Mahony
Engineering Honours (Biomedical)

Gain experience beyond the lecture hall

Tour key Australian biomedical companies

Our strong industry links enable our students to connect and network with key leaders and engineers in the local Australian biomedical field. During this semester-long tour, students speak face to face with experienced staff in companies. In 2016 they included Cochlear, ResMed, Nanosonics, Saluda Medical, Global Orthopaedics, Corin, Stryker, Zimmer-Biomet, Medtronic and Abbot. This is to better understand the scope of their activities, see their facilities – including clean room manufacturing – and gain a unique insight into medical technologies.

Medtech Innovation Competition

Partnering with Westmead Hospital and Sydney clinical and industry experts, students have a great opportunity to present their innovative solutions to today's medical problems. As a member of a student team, you'll have the opportunity to present your innovative research proposals with interactive prototype and project displays to our industry partners.

"The biomedical engineering program at the University of Sydney gave me a lot of connections to industry, which have been very valuable in my career so far."

Dr Brad Miles
Engineering Honours (Biomedical)/PhD graduate
Chief Technical Officer, 360 Knee Systems

BACHELOR OF ENGINEERING HONOURS (CHEMICAL AND BIOMOLECULAR)

Chemical and biomolecular engineers use chemistry, biology, mathematics and physics to turn raw materials into useful products for everyday life. They help manage resources, protect the environment and improve health and safety products and procedures.

They research raw materials and their properties as well as design and develop equipment and processes to more efficiently and sustainably manufacture products such as pharmaceuticals, foods, fuels and household and industrial chemicals.

Create life-changing, sustainable solutions

Our Bachelor of Engineering Honours (Chemical and Biomolecular) degree combines collaborative learning and research with first-hand industry experience, enabling you to meet the challenges faced by the chemicals, minerals, energy and agriculture, food, beverage and pharmaceutical sectors.

As a chemical and biomolecular engineering student you will learn from leading professionals and researchers as you develop a sophisticated knowledge of chemical, environmental, energy, food and water engineering. You will understand how to transform raw materials into beneficial products using chemistry, biology, physics and mathematics.

Throughout your studies you will also discover the emerging fields of nanotechnology and molecular biology, which are revolutionising energy and storage systems, food production and the healthcare industry.

Your four-year degree combines practical learning, industry projects and specialised electives to enable you to become a catalyst in creating a sustainable society. The professional engagement program will give you invaluable practical experience to complement your comprehensive technical knowledge.

An embedded honours thesis enables you to design your own research project in a field of your choice.

CAREER SNAPSHOT

Work in a large-scale plant improving the production of food, plastic, ceramic, pharmaceutical, glass, metal or biomedical products.

–

Protect the environment through pollution control or decontamination projects.

–

Lead innovation in healthcare, such as tissue engineering.

–

A broad range of international work opportunities, from providing water in third-world communities to improving energy production in multinational fuel companies.

–

Graduate salaries start at $60.5K per annum.^

^Graduate Opportunities (published by Graduate Careers Australia)

Majors

There are more than 15 engineering majors to choose from. The major that best aligns with this degree is Humanitarian Engineering.

Humanitarian Engineering

This major will help you develop the crucial skills to plan, implement and maintain infrastructure in rural Australian areas and developing countries. Explore international aid and development, and learn from experienced practitioners and industry partners about how to work in disadvantaged communities, fragile states and communities in disaster recovery. You'll also have the opportunity to conduct local or overseas fieldwork.

There is also a wide range of optional majors including Materials Engineering, Electrical Engineering, Internet of Things, Structures, Information Technology and Mechatronic Engineering. You may choose additional units of study if you wish to major in a particular area of engineering.

Sample course structure: Bachelor of Engineering Honours (Chemical and Biomolecular)

Year 1
Degree core: Engineering Computing
Degree core: Introduction to Chemical Engineering
Degree core: Chemistry 1A
Degree core: Chemistry 1B
Degree core: Material and Energy Transformations Introduction
Degree core: Linear Algebra
Degree core: Calculus of One Variable
Degree core: Statistics
Degree core: Multivariable Calculus and Modelling
Degree core: Integrated Engineering 1
Year 2
Degree core: Integrated Engineering 2
Degree core: Energy and Fluid Systems Practice
Degree core: Conservation and Transport Processes
Degree core: Applied Maths for Chemical Engineers
Degree core: Chemical and Biological Systems Behaviour
Degree core: Materials Purification and Recovery
Degree core: Industrial Systems and Sustainability
Elective: Molecular Reactivity and Spectroscopy*
Elective: Chemical Structures and Stability*

Year 3
Degree core: Integrated Engineering 3
Degree core: Control and Reaction Engineering
Degree core: Process Design
Degree core: Products and Value Chains
Degree core: Chemical/Biological Process Design
Degree core: Management of Industrial Systems
Degree core: Product Formulation and Design
Elective: Polymer Engineering*
Elective: Laboratory and Industrial Practice*
Year 4
Degree core: Integrated Engineering 4
Degree core: Chemical Engineering Design A
Degree core: Chemical Engineering Design B
Degree core: Thesis A
Degree core: Thesis B
Practical Experience
Elective: Membrane Science*
Elective: Process Systems Engineering*
Elective: Materials Chemistry*

*These are just some of the many electives available to students. Units are indicative only.

"To be able to provide safe drinking water, inexpensive medicines and cleaner energy is so empowering. I was drawn to the fact that there is so much potential for humanitarian engineering using the knowledge gained from this degree."

Lucy Parsons
Engineering Honours (Chemical and Biomolecular)

Gain experience beyond the lecture hall

Major Industrial Project Placement Scholarship scheme

The Major Industrial Project Placement Scholarship (MIPPS) scheme provides the top 25 percent of final-year undergraduate students with the opportunity to work for six months full time in leading companies such as Dow Chemical, BOC, Visy, Hazer Group and Osaka Gas.

The overseas placements with Dow Saudi Arabia and Papuan Oil Search are a wonderful chance for you to immerse yourself in another culture while you get on-the-job experience working on a real-world project.

Week in industry

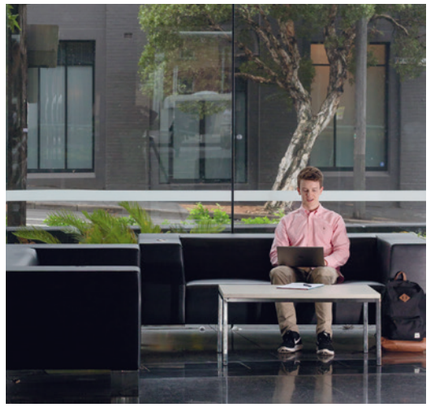
Get a taste of a career in chemical and biomolecular engineering in the third year of your degree with our industrial experience program, 'Week in Industry'. The participating companies will set you an authentic project within their organisation, give you a workstation and a mentor to assist and evaluate your progress. At the end of your week you'll prepare a report and presentation to be delivered to the company staff and supervisors. It's a great chance to build your network for future job opportunities.

Plant tours

Take a closer look at larger scale processes in the water, waste, oil refineries and pharmaceutical industry through one or more plant tours scheduled as a part of your degree. This will give you a taste of what your ultimate job might involve as a chemical engineer.

"For my thesis I combined my love of chemical engineering and renewable energy with artificial intelligence and this is how I got my current job at CSIRO. Once you have the skills to take what you know and apply it in new situations, in new creative ways, there are no limits to where you can go."

Renee Noble
Engineering Honours (Chemical and Biomolecular)/Science graduate
Software engineer, Data 61 – CSIRO



"At the University of Sydney you have the opportunity to be selected for MIPPS, a six-month industry placement in Australia or overseas, with the chance to work in leading companies such as Dow Chemical and BOC. Chemical Engineering teaches you a new way of problem solving that applies to many aspects of life, opening the door to a vast range of career opportunities."

William North
Engineering Honours (Chemical and Biomolecular)

BACHELOR OF ENGINEERING HONOURS (CIVIL)

The homes we live in, the roads we travel on and the bridges we cross are all designed and planned by civil engineers. The creation of Dubai's towering Burj Khalifa, Beijing's 'Bird's Nest' National Stadium and Sydney's iconic Opera House and Harbour Bridge are all feats of civil engineering.

Civil engineering is a broad profession that combines functional solutions with creativity and innovation to improve society. Civil engineers are responsible for the design and construction of such things as buildings, towers and transport infrastructure as well as the design and management of gas and water systems, sewerage schemes, irrigation systems and mines.

Design and build your own future

Our Bachelor of Engineering Honours (Civil) provides you with a suite of embedded technical and professional skills to create infrastructure that improves lives throughout the world. Learn from leading experts within various fields as you pursue a career in construction, mining, consultancy, project management or public works. Complementing this technical knowledge will be a range of professional skills in management, finance and problem solving.

Throughout this four-year degree you will study a series of core units as you master the foundations of civil engineering, before specialising in an optional major. In your second year a surveying camp will allow you to develop your technical skills in a practical, team-based environment. In your third year a 12-week internship will provide you with invaluable industry experience and the opportunity to forge industry connections. In your fourth year you will undertake further specialised civil engineering subjects and complete an embedded honours thesis, which enables you to design a research project in an area that interests you.

Majors

There are more than 15 engineering majors to choose from. Those that best align with this stream are Construction Management, Environmental Engineering, Geotechnical Engineering, Humanitarian Engineering, Structures and Transport Engineering.

Construction Management

Gain the knowledge and vital skills required in the application of projects and programs in the construction industry. You'll learn about organisation and management, design and construction, the economics of construction projects and project administration systems.

Environmental Engineering

Environmental engineers are concerned with protecting the environment by assessing the impact a project has on the air, water, soil and noise levels in its vicinity.

In this major you will be able to take advanced units of study related to areas such as environmental solutions to man-made problems, ocean and coastal engineering, water resources and hydrology and environmental geotechnics.

Geotechnical Engineering

Get your hands dirty determining the physical and chemical properties of soil and rock layers as you learn how to design foundations and earthworks structures for buildings, roads and many other types of projects. A major in Geotechnical Engineering can lead you to work on a commercial building site in the city one day and drilling at a river crossing in Far North Queensland the next.

Structures

Refine your mathematical, analytical and technical skills to create innovative solutions to the many natural and man-made problems faced when designing and planning for building. A major in structures can be applied across various areas of work, including bridges and tunnels, buildings, or large constructions such as oil installations.

Transport Engineering

Transport Engineering involves the planning, design, operation and management of infrastructure to achieve safe, economical and environmentally sustainable movement of people and goods. This major combines mathematical and engineering methods, with multidisciplinary issues such as environmental and social impact, economics and government policy.

For details of the Humanitarian Engineering major, see page 22.

CAREER SNAPSHOT

Build green-efficient buildings using the latest technologies, work on water purification and sanitation in developing countries, help people travel safely and quickly, or plan the next amusement park.

–

Work in an established company, government or not-for-profit organisation.

–

Apply technical skills, including mathematics and physics, to identify and solve engineering problems, such as accurately determining how much weight can be safely distributed throughout a bridge.

–

Help farming communities in developing nations by planning, implementing and maintaining important infrastructure, such as irrigation systems for crop harvesting.

–

Enjoy a dynamic working environment, with opportunities to work and travel overseas.

–

Graduate salaries for both men and women start at $60–63K per annum.^

^Australian Government GradStats – Starting salaries 2015

© The University of Sydney

"Sydney is in the middle of an exciting growth period and I anticipate a large demand for civil engineers within the transport and infrastructure sectors to help with this transformation."

Win Myint Kwaw
Engineering Honours (Civil)

"Studying at the University of Sydney has provided me the opportunity to work on projects that make a real difference in the world. Being involved with Engineers Without Borders has allowed me to apply what I've learnt in lecture halls to help people living in less-developed communities in countries like Laos, Nepal and India."

Brian O'Callaghan
Engineering Honours (Civil)/Commerce

Sample course structure: Bachelor of Engineering Honours (Civil), majoring in structures

Year 1
Degree core: Introduction to Civil Engineering
Degree core: Engineering Computing
Degree core: Calculus of One Variable
Degree core: Linear Algebra
Degree core: Integrated Engineering 1
Degree core: Engineering Geology 1
Degree core: Engineering Mechanics
Degree core: Engineering Construction and Surveying
Degree core: Statistics
Degree core: Multivariable Calculus and Modelling
Year 2
Degree core: Transport Systems
Degree core: Linear Mathematics and Vector Calculus
Degree core: Structural Mechanics
Degree core: Materials
Degree core: Integrated Engineering 2
Degree core: Project Appraisal
Degree core: Introductory Fluid Mechanics
Degree core: Soil Mechanics
Degree core: Environmental Engineering

Year 3
Degree core: Concrete Structures 1
Degree core: Fluid Mechanics
Degree core: Integrated Engineering 3
Degree core: Steel Structures 1
Degree core: Engineering Design and Construction
Degree core: Structural Analysis
Elective: Traffic Engineering*
Elective: Humanitarian Engineering*
Elective: Geotechnical Engineering*
Year 4
Degree core: Civil Engineering Design
Degree core: Thesis A
Degree core: Thesis B
Degree core: Integrated Engineering 4
Elective: Numerical Methods in Civil Engineering*
Elective: Steel Structures – Stability*
Elective: Advanced Concrete Structures*
Elective: City Logistics*
Practical Experience

* These are just some of the many electives available to students. Units are indicative only.

Gain experience beyond the lecture hall

Boundary Layer Wind Tunnel

You will have the opportunity to create solutions to complex wind engineering problems at the project design stage using this state-of-the-art facility. Students from various civil engineering majors can witness first hand how their building designs fare against real-world environmental conditions by generating wind velocities of up to 100 km/h.

Design Summit

Apply your humanitarian engineering knowledge to design and create positive change within disadvantaged communities overseas. Working with Engineers Without Borders, students embark on a two-week educational study tour and interact with local communities, attend workshops and develop solutions to real-world problems. They also gain a deeper understanding of the role design and technology plays in the developing world.

"The University of Sydney gave me more than an engineering degree: it provided the foundation for a diverse and rewarding career spanning infrastructure, mining, utilities and heavy industry across Australia and internationally. It also underpinned my professional development from Site Engineer to CEO through the broad experiences of university life."

Mark Elliot
Engineering Honours (Civil) graduate
CEO, Northwest Rapid Transit

BACHELOR OF ENGINEERING HONOURS (ELECTRICAL)

Create a brighter future by exploring the branch of engineering concerned with harnessing electricity.

Electrical engineers design the electronic devices, computers, communications systems and power systems that have, and continue to, transform society. This covers everything from the computers and networking equipment enabling the internet through to the power stations providing electricity to your home.

Be prepared for future technology jobs

The Bachelor of Engineering Honours (Electrical) will provide you with the necessary professional skills to create better sensors and computing devices, more efficient energy networks and the latest innovative communications technology. Learn from industry-leading professionals spanning various fields as you pursue a career in telecommunications, computer engineering or power engineering.

Throughout this four-year degree you will gain core skills in physics, mathematics, computer science and basic electrical engineering principles, before specialising in a variety of fields within the discipline. In your third and fourth years you can take electives to add breadth and depth to your studies. A 12-week internship will provide you with invaluable industry experience and the opportunity to forge industry connections. This is complemented by an embedded honours thesis, which enables you to design a research project in an area that interests you.

"The energy industry is undergoing a lot of change and there are many new opportunities for electrical engineers to work on renewable energy projects and electricity transmission infrastructure, and provide advice to investors."

Aaron Ramsden
Engineering Honours (Electrical) graduate
Electrical Engineer, Aurecon

CAREER SNAPSHOT

Develop the next generation of infrastructure and devices based on the Internet of Things.

–

Exercise your creativity by networking mobile devices within vehicles, buildings and other electronic products.

–

Apply your technical skills in power systems to develop cost-effective renewable energy sources in developing nations.

–

Work for a multinational company, power distribution company or within the telecommunications industry.

–

Take opportunities to work abroad to enhance your skills and experience.

–

Graduate salaries for both men and women start at $60–63K per annum.^

^Australian Government Gradstats – Starting salaries 2015

“Nearly every week I discover a new problem within electrical engineering that I want to understand, work on and ultimately solve. The degree feeds my curiosity about the way the world works and highlights the important role electrical engineers play in shaping it.”

Sarah Murphy
Engineering Honours (Electrical)/
Science (Mathematics)

Majors

There are more than 15 engineering majors to choose from. Those that best align with this stream are Computer Engineering, Internet of Things, Power Engineering and Telecommunications Engineering.

Computer Engineering

Learn how to design and develop software and hardware for embedded, mobile and server based systems by specialising in computer engineering. A wide range of electives is also available, including studies in computer architecture, signal processing and biomedical devices.

Internet of Things

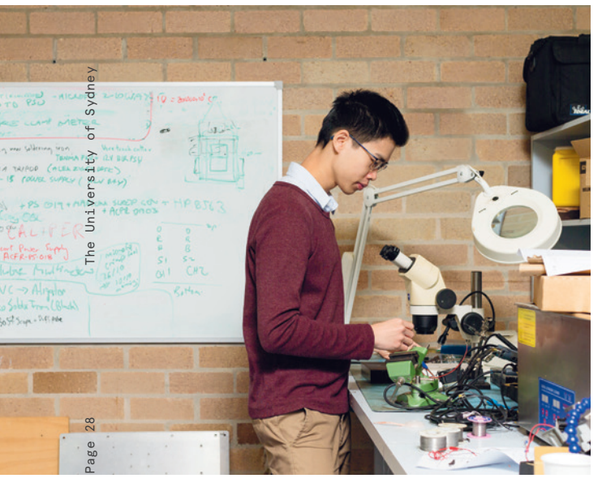
The Internet of Things (IoT) refers to the interconnection via the internet of computing devices embedded in objects, enabling them to send and receive data. This exciting major covers the three key aspects of IoT by combining the study of telecommunications, electrical and computer engineering, with an emphasis on wireless communications, networks, sensor devices, data technologies and its applications in smart grids and critical infrastructure.

Power Engineering

Learn the skills to plan, design, construct, operate and maintain power systems and equipment that generate, transport and distribute electricity. This major has been designed in consultation with key industrial partners and is complemented with real-world project work.

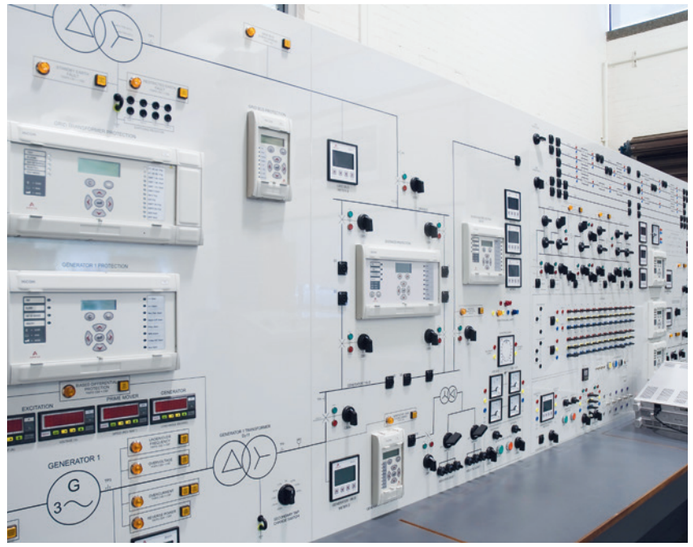
Telecommunications Engineering

This major covers the design, planning, commissioning and monitoring of complex telecommunications networks and broadcasting equipment. Explore the theory and application for a broad range of systems, including telephone and data networks, radio and television broadcasting, satellite and deep space applications.



“The Bachelor of Engineering Honours (Electrical) degree provides the technical proficiency to prepare you for the future. The new Internet of Things specialisation is upskilling students within one of the largest and fastest-growing markets in communication.”

Ignatius Widjaja
Engineering Honours (Electrical)



Sample course structure: Bachelor of Engineering Honours (Engineering), majoring in Telecommunications Engineering

Year 1
Degree core: Calculus of One Variable
Degree core: Linear Algebra
Degree core: Integrated Engineering 1
Degree core: Statistics
Degree core: Multivariable Calculus and Modelling
Degree core: Introduction to Computer Systems
Degree core: Physics 1 (Technological)
Degree core: Physics 1 (Regular)
Degree core: Introduction to Programming
Elective: Engineering Critical Thinking*
Year 2
Degree core: Integrated Engineering 2
Degree core: Fundamentals of Electrical and Electronic Engineering
Degree core: Digital Logic
Degree core: Linear Mathematics and Vector Calculus
Degree core: Data Structures and Algorithms
Degree core: Simulation and Numerical Solutions in Engineering
Degree core: Electronic Devices and Circuits
Degree core: Signals and Systems
Degree core: Physics 2EE

Year 3
Degree core: Integrated Engineering 3
Elective: Electricity Networks*
Elective: Power Electronics and Applications*
Elective: Management for Engineers*
Elective: Control*
Telecommunications major: Communications
Telecommunications major: Digital Signal Processing
Telecommunications major: Data Communications and the Internet
Telecommunications major: Communications Electronics and Photonics
Year 4
Degree core: Thesis A
Degree core: Integrated Engineering 4
Practical Experience
Degree core: Thesis B
Elective: Mobile Networks
Elective: Optical Communication Systems
Elective: Wireless Engineering*
Elective: Satellite Communications Systems
Telecommunications major: Digital Communication Systems

* These are just some of the many electives available to students. Units are indicative only.

Gain experience beyond the lecture hall

Sir William Tyree Laboratory

Students studying the Power Engineering major have the opportunity to utilise the state-of-the-art facilities on offer within the Sir William Tyree laboratory. This modern work area is ideal for students wanting to learn the design, construction and maintenance methods of power systems in a hands-on environment under the guidance of industry-leading professionals.

Centre of Excellence in Telecommunications

Be at the forefront of innovation in broadband telecommunications, wireless engineering and networking by connecting with the Centre of Excellence in Telecommunications.

The centre was created to foster world-class research and education. Students undertaking majors in either Telecommunications Engineering or the Internet of Things can use it to develop their required final-year project, under the direction of research specialists.

BACHELOR OF ENGINEERING HONOURS (MECHANICAL)

Mechanical engineers design and develop everything you think of as a machine – from supersonic fighter jets, space vehicles and car engines to elevators and air conditioners.

With the growing demand for mechanical engineers in the environmental, biomedical, aerospace and nanotechnology fields, a mechanical engineering career can be diverse, with opportunities to innovate around every corner.

Design the machines of tomorrow

Our Bachelor of Engineering Honours (Mechanical) will develop your ability to design and maintain a wide range of mechanical applications. You will learn about all aspects of mechanical engineering, including power generation, transport, building services, machinery, manufacturing, computer-aided design, advanced materials and environmental studies.

Through practical learning and industry experiences, you will be ready to transform the use of machines across a range of innovative and emerging industries.

Majors

There are more than 15 engineering majors to choose from. Those that best align with mechanical engineering are Space Engineering, Environmental Engineering and Materials.

Space Engineering

The Space Engineering major at Sydney is the only program of its kind offered in Australia. It looks into the world of orbital mechanics, space vehicles, space avionics and robotics. Through this major you could become a space engineer within the aerospace, defence, environmental or research industries, designing and building satellite subsystems, space robotic programs and interplanetary space systems.

Environmental Engineering

The Environmental Engineering major teaches you the analytical and technical skills to create solutions in the natural world. This includes renewable and sustainable energy generation, computational fluid dynamics and acoustics.

Materials

Understand the relationship between the properties of materials and engineering design. Explore mechanical properties, fracture and fatigue mechanics, composite materials and ceramics and glasses.

"What I love most about my mechanical degree is that what I learn can be seen in the world around us, like material properties or force distribution in structures."

Borison Choy
Engineering Honours (Mechanical)/Commerce

"I love the diversity a mechanical engineering degree offers; that I can go from a manufacturing lecture to one about designing efficient wind farms. There are so many great electives to choose from, letting you sample everything from early on."

Leah Cooke
Engineering Honours (Mechanical)/Arts

Sample course structure: Bachelor of Engineering Honours (Mechanical)

Year 1
Degree core: Linear Algebra
Degree core: Calculus of One Variable
Degree core: Statistics
Degree core: Calculus and Modelling
Degree core: Integrated Engineering 1
Degree core: Introduction to Mechanical Engineering
Degree core: Engineering Mechanics
Degree core: Materials 1
Degree core: Engineering Computing
Elective: Mechanical Construction*
Year 2
Degree core: Integrated Engineering 2
Degree core: Engineering Dynamics
Degree core: Instrumentation
Degree core: Fluid Mechanics 1
Degree core: Engineering Analysis
Degree core: Mechanics of Solids 1
Degree core: Mechanical Design 1
Degree core: Thermal Engineering 1
Elective: Engineering Management*

Year 3
Degree core: Integrated Engineering 3
Degree core: Materials 2
Degree core: Manufacturing Engineering
Degree core: Fluid Mechanics 2
Degree core: System Dynamics and Control
Degree core: Mechanics of Solids 2
Degree core: Mechanical Design 2
Degree core: Thermal Engineering 2
Elective: Engineering Methods*
Year 4
Degree core: Thesis A
Degree core: Thesis B
Practical Experience
Degree core: Integrated Engineering 4
Elective: History and Philosophy of Engineering*
Elective: Energy and the Environment*
Elective: Advanced Computational Fluid Dynamics*
Elective: Computational Nanotechnology*
Elective: Vibration and Acoustics*

* These units are just some of the many electives available to students. Units are indicative only.

^Open Universities Australia
^^Australian Government Gradstats – starting salaries 2015

CAREER SNAPSHOT

Develop and improve mechanical systems such as biomedical devices, automatic control systems, environmental pollution control devices, clean combustion, underwater exploration and space vehicles.

–

Lead the development of technologies that improve our world within the fields of health, the environment, travel and renewable energy.

–

Apply your knowledge across a variety of fields, taking your career into health, transport, the environment, automotive industry or renewable energy.

–

Work for small start-ups or large corporations like Google, Honeywell, Boeing, Lockheed Martin Corporation, Ford, Rio Tinto or NSW Transport.

–

Employment for mechanical engineers has risen by 18.8 percent over the past five years and is expected to keep growing.^

–

Graduate salaries start at $60–63K per annum.^^

Gain experience outside the lecture hall

Formula SAE

Interested in building race cars? Each year students from across a variety of engineering disciplines can create their own racing car. Formula SAE (Society of Automotive Engineers) is a four-day international student engineering competition where students design, construct and race an internal combustion or electric race car.

Students develop their skills in design, management, manufacturing, communication, research and business operations, as though they were working for a start-up in the automotive industry.

Sydney Industry Project Placement Scholarship

Fourth-year students can take part in a six-month industry placement either in Australia or overseas, contributing to their major thesis project. Not only are their practical skills and knowledge developed at a company they're interested in, they receive financial support through the scholarship. These positions are highly sought after, with students working for organisations like NASA's Jet Propulsion Laboratory in California, Accenture, Qantas and Google.

This program is also available to mechatronic, aeronautical and electrical engineering students.

"I was fortunate to undertake a work placement while at the University of Sydney, prototyping a solar collector. I graduated and went on to build a solar system up in the Hunter Valley, which attracted the investment of Silicon Valley venture capitalists to the tune of about $50 million. That saw me move over to the United States, where I have been working in renewable energy."

Andrew Tanner
Engineering Honours (Mechanical)/Commerce (Business) graduate
Vice President of Business Development, Geli

BACHELOR OF ENGINEERING HONOURS (MECHATRONIC)

Mechatronic engineering combines mechanical, electronic and software engineering to create computer-controlled machines and 'smart' products. It underpins the technology behind robotics and autonomous systems, automated manufacturing and 'intelligent' microprocessor-based technologies.

Mechatronic engineers work with electrical and mechanical systems to solve a variety of problems across engineering disciplines. Their skills in computer hardware, software and networking allow them to be versatile problem solvers.

When your washing machine senses the size of your washing and adds just the right amount of water, it's due to the work of a mechatronic engineer.

Lead the next generation of machine design

Our Bachelor of Engineering Honours (Mechatronic) enables you to design and create computer-controlled machines and 'smart' consumer technologies. Combining industry experience and management skills, you will be equipped to tackle the exciting challenges of this rapidly evolving field.

As a mechatronic engineering student, you will develop skills in digital electronics, microprocessors, computer control, electrical machines, machine dynamics and design, robotic systems and software design, as well as a range of professional skills in management and communications.

^Australian Government - Gradstats starting salaries 2015

CAREER SNAPSHOT

Design and create control systems, robots and innovative machines and products that make people's lives easier and their work more efficient.

–

Choose from a wide range of industries: product design and development, mining, biotechnology, manufacturing, traditional and non-traditional automation, computer system and software design, transportation, power systems and defence.

–

Revolutionise industries like agriculture, farming, mining and transport by developing automated systems that improve reliability and increase productivity.

–

Work for the latest start-up or more established corporations like ResMed, Honeywell, Hyundai, Lockheed Martin, Rockwell Automation, Thales, Bayer or Austcorp.

–

Graduate salaries start at $60–63K per annum.^

Majors

There are more than 15 engineering majors to choose from. The major that best aligns with this stream is Space Engineering.

Space Engineering

The Space Engineering major at Sydney is the only program of its kind offered in Australia. It looks into the world of orbital mechanics, space vehicles, space avionics and robotics.

Through this major you could become a space engineer within the aerospace, defence, environmental or research industries, designing and building satellite subsystems, planetary rovers and interplanetary space systems.

Sample course structure: Bachelor of Engineering Honours (Mechatronic)

Year 1
Degree core: Linear Algebra
Degree core: Calculus of One Variable
Degree core: Statistics
Degree core: Multivariable Calculus and Modelling
Degree core: Integrated Engineering 1
Degree core: Introduction to Mechatronic Design
Degree core: Introduction to Mechatronic Engineering
Degree core: Engineering Computing
Degree core: Mechatronics 1
Degree core: Engineering Mechanics
Year 2
Degree core: Integrated Engineering 2
Degree core: Mechatronics 2
Degree core: Engineering Dynamics
Degree core: Fundamentals of Electrical and Electronic Engineering
Degree core: Electronic Devices and Circuits
Degree core: Mechanical Design 1
Degree core: Mechanics of Solids 1
Degree core: Materials 1
Elective: Engineering Analysis*

Year 3
Degree core: Integrated Engineering 3
Degree core: Manufacturing Engineering
Degree core: Power Electronics and Applications
Degree core: System Dynamics and Control
Degree core: Mechatronic Systems Design
Degree core: Mechatronics 3
Degree core: Mechanical Design 2
Elective: Sensors and Signals*
Elective: Electronic Circuit Design*
Year 4
Degree core: Thesis B
Degree core: Integrated Engineering 4
Practical Experience
Degree core: Thesis A
Elective: History and Philosophy of Engineering*
Elective: Advanced Control and Optimisation*
Elective: Experimental Robotics*
Elective: Computer Vision and Image Processing*
Elective: Introduction to Biomechatronics

* These units are just some of many electives available to students. Units are indicative only.

"The most exciting thing about my degree is the hands-on opportunities to apply what I've learnt in the classroom. Last year I had the chance to work with researchers on a self-driving car project through the Australian Centre for Field Robotics, assisting with the design and programming."

Sholto Douglas
Engineering Honours (Mechatronic)/Commerce (Business Analytics/Economics)

Gain experience beyond the lecture hall

Australian Centre for Field Robotics

The Australian Centre for Field Robotics (ACFR) is one of the largest robotics research institutes in the world and at the forefront of research and development in autonomous robots and systems. Undergraduate students can work with researchers from this world-class innovation hub on projects, such as developing an autonomous car.

FAB Lab

The Fabrication Lab (FAB Lab) was developed so that students could continue to learn and apply their skills outside the lecture theatre. This 'maker space' gives students the resources and facilities to design and build their own innovations using a variety of contemporary manufacturing technologies such as 3D printing.

"My mechatronic degree is helping me reach my career aspirations because I'm building the technical knowledge I'll need to go into industry. It is also helping me to problem solve, deal with a high volume of work, prioritise and remain organised. Those skills are an important part of achieving my goals for the future."

Edward Fay
Engineering Honours (Mechatronic)/Science (Advanced)

"Completing my undergraduate and postgraduate engineering studies at Sydney provided both the theoretical and practical skills that are necessary to be competitive on the world stage. This led me to live in the US, where I'm working on autonomous airborne systems in some of the most cutting-edge aerospace projects."

Daniel Wilson
Engineering Honours (Mechatronic) graduate
Co-Founder/CEO, OCI Technologies

BACHELOR OF ENGINEERING HONOURS (SOFTWARE)

Software refers to all the information processed by computer systems – from web browsers and computer programs to mobile applications and digital media programs. Software engineering delves deeper and focuses on the design and maintenance of software systems that are reliable and efficient, cost effective to develop and overall meet the specific needs of the user.

Be prepared for the industries of tomorrow

Our Bachelor of Engineering Honours (Software) will prepare you with the essential skills needed to stand out in a rapidly evolving industry. Industry-leading professionals will teach you practical skills and theoretical knowledge across all aspects of software production, from strategy and design to coding, quality and management.

Throughout this four-year degree you will acquire skills that provide the foundation for further studies in software design, development, security and management. You'll learn programming and computer languages, data structures, algorithms and databases and software project management. In your third year, a 12-week internship will provide you with invaluable industry experience and the chance to network with practising professionals. In your fourth year, you will complete an embedded honours thesis where you will undertake a research project in an area that interests you.

Majors

There are more than 15 engineering majors to choose from. Those that best align with this stream are Computer Engineering, Power Engineering and Telecommunications Engineering.

Computer Engineering

Learn how to design and develop software and hardware for embedded, mobile and server-based systems by specialising in computer engineering. A wide range of electives is also available, including studies in computer architecture, signal processing and biomedical devices.

Power Engineering

Learn the skills to plan, design, construct, operate and maintain power systems and equipment that generate, transport and distribute electricity. This major has been designed in consultation with key industrial partners, and is complemented with authentic project work.

Telecommunications Engineering

This major covers the design, planning, commissioning and monitoring of complex telecommunications networks and broadcasting equipment. Explore the theory and application for a broad range of systems, including telephone and data networks, radio and television broadcasting, satellite and deep space applications.

"Software is all around us and impacts society in many different ways. Studying at the University of Sydney introduced me to many contacts, and afforded me with the necessary foundations needed to continue building amazing software products."

Simon Ratner
Engineering (Software) graduate
Founder and Chief Technical Officer, Martians Inc.

Sample course structure: Bachelor of Engineering Honours (Software)

Year 1
Degree core: Calculus of One Variable
Degree core: Linear Algebra
Degree core: Integrated Engineering 1
Degree core: Statistics
Degree core: Multivariable Calculus and Modelling
Degree core: Introduction to Computer Systems
Degree core: Introduction to Programming
Degree core: Programming 2
Elective: Accounting, Business and Society*
Elective: Foundations of Information Technology*
Year 2
Degree core: Integrated Engineering 2
Degree core: Systems Programming
Degree core: Data and Information Management
Degree core: Discrete Mathematics and Graph Theory
Degree core: Data Structures and Algorithms
Degree core: Analysis and Design of Web IS
Degree core: Software Construction and Design
Degree core: Software Processes
Elective: Formal Languages and Logic*
Year 3
Degree core: Integrated Engineering 3
Degree core: Principles of Computer and Communication Security
Degree core: Software Construction and Design 2
Degree core: Software Development Program
Degree core: Internet Software Platforms
Elective: E-Business Analysis and Design*
Elective: Graphics and Multimedia*
Elective: Marketing Principles*
Elective: Programming Languages and Paradigms*
Year 4
Degree core: Thesis A
Degree core: Integrated Engineering 4
Practical Experience
Degree core: Thesis B
Degree core: Enterprise Scale Software Architecture
Degree core: Software Quality Engineering
Degree core: Object Oriented Application Frameworks
Elective: Model Based Software Engineering*
Elective: Visual Analytic*

* These units are just some of the many electives available to students. Units are indicative only.

CAREER SNAPSHOT

Apply your computer coding skills to develop the latest mobile phone application, video game or web browser used across the globe.

–

Use your analytical skills to determine how to make existing software more streamlined and user compliant.

–

Work for a multinational company, governmental sector or launch your own start-up.

–

Global work opportunities across sectors including defence, security finance, telecommunications and electronics.

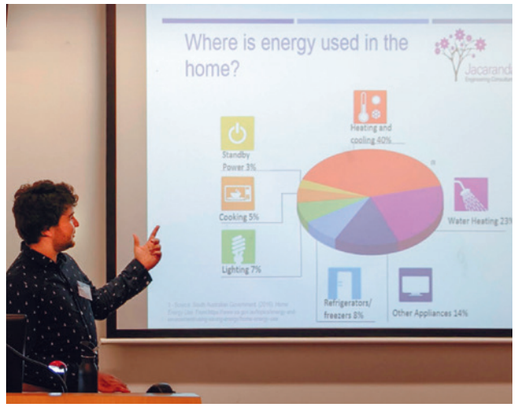
–

This career is ideal for creative and analytical thinkers who enjoy coding and teamwork.

–

Graduate salaries for both men and women start at $53-57K per annum.^

^Australian Government Gradstats - Starting salaries 2015



Gain experience beyond the lecture hall

Design and create your own software

Develop the essential design and practical skills every software engineer needs by undertaking fun and exciting hands-on projects embedded throughout your degree. Students studying computer, Telecommunications or Power Engineering majors are required to complete several group-based assignments that may include creating remote-controlled fire-fighting robots or building bioamplifiers that measure electrical brain activity.

Jacaranda Engineering Consultants

Students studying engineering, computing or project management degrees can gain insights into the working life of a professional engineer by joining the Jacaranda Engineering Consultants program. Spanning nine weeks, students undertaking the annual program work as teams to devise solutions to real-life problems proposed by leading commercial companies. The program is designed to provide participants with valuable practical experience that contributes to their overall coursework.

"The Bachelor of Engineering Honours (Software) degree combines analytical thinking with my passion to create real-world products that will benefit society. It's more than just learning about coding – you gain valuable project management, communication and teamwork skills that will assist you in the workplace."

Justin Dang
Engineering Honours (Software)

BACHELOR OF ENGINEERING HONOURS (FLEXIBLE FIRST YEAR)

Are you still uncertain of which engineering stream to take? There's no need to decide now. Our Bachelor of Engineering Honours (Flexible First Year) allows you to begin your studies with the freedom to decide on your area of specialisation later while completing your degree in the normal time (four years).

Get a taste of each discipline before choosing one

The Flexible First Year Program allows you to explore different engineering disciplines before deciding upon your ultimate course of study. You will undertake a common set of units before transferring into your preferred stream. The Bachelor of Engineering Honours can be undertaken in the following streams: Aeronautical, Biomedical, Chemical and Biomolecular, Civil, Electrical, Mechanical, Mechatronic, and Software. You can even do Flexible First Year with a combined degree. For more details on combined degrees, see page 46.

Enjoy all the same benefits

In all streams you will undertake a mandatory 10–12 week industry placement, plant and site visits, and enjoy opportunities for the development of significant professional relationships with industry partners. An embedded honours thesis or research project will allow you to further specialise in an area of your interest. You will also have the option to complete one or more majors throughout your degree, choosing from more than 15 different options, depending on your stream.

"I chose the Flexible First Year Program as I had no idea which stream I wanted to study. It definitely helped me, as I was able to experience all the different disciplines over a semester and discover which one I enjoyed the most. I don't think I would ever have thought of choosing Mechanical Engineering, my current stream, if I hadn't done the program."

Ella Kerr
Engineering Honours (Mechanical)

PROJECT MANAGEMENT

BACHELOR OF PROJECT MANAGEMENT

Project managers work behind the scenes to make sure things get done. They help organisations deliver new products, services and infrastructure, implement new systems and processes and ultimately effect change.

Project management skills are therefore highly regarded and sought after because they can be applied to many different situations, such as disease and disaster recovery scenarios that require an innovative and dynamic approach.

Enjoy a unique experience

Our Bachelor of Project Management is unique and will provide you with the fundamental project management skills, theories and methods required in today's complex business environment. Learn from leading experts who will employ multidisciplinary theories and methods that will equip you to understand the dynamics of how projects are scoped, delivered and managed. The approaches and skills you acquire will cover the fundamentals of project management and you will be able to apply them in all industries.

During this three-year degree, you will study a range of core subjects including project finance, statistics, analytics, risk management, organisational behaviour, communication and stakeholder management. These subjects are integrated with units of study from your chosen stream: Civil Engineering Science, Built Environment or Software.

Over your final year, you will complete a capstone project, working as part of a team to initiate, plan, execute, control and close an industry-style project. You can also extend your studies a further year to graduate with honours.

CAREER SNAPSHOT

Oversee the delivery of large-scale projects across a number of industries including engineering, computer programming, health, construction, major events management, mining or finance.

Apply leadership skills and best practices to oversee schedules, costs, scope balance and staff.

Work in an established company, government agency or not-for-profit sector.

Skills are transferable across industries so your career prospects will be many and diverse.

A dynamic working environment with opportunities to travel overseas for employment.

Graduate salaries vary by industry sector.

Streams

There are three streams available to choose: Built Environment, Civil Engineering Science and Software.

Built Environment

Acquire a broad foundation in architecture and the built environment, covering aspects such as city form and development, property, construction and sustainable architecture practice.

Civil Engineering Science

Gain knowledge in civil engineering, covering areas such as structural mechanics, transport systems, engineering construction and surveying. You will also be able to further specialise in areas of your interest.

Software

Understand the application of learning within the computer and IT industry, covering areas such as data structures, systems analysis and modelling, and e-business analysis and design.

"The Bachelor of Project Management is providing me with a broad skillset that will prepare me to work within a broad variety of industries, including construction, which I hope to pursue a career in."

Zhili Guo
Project Management/Engineering Honours (Civil)

"A combination of engineering and project management is unique to the University of Sydney and ultimately the reason I chose to study here. I wanted to go to a reputable university that had strong resources to aid innovation in growing fields."

Annette Bui
Project Management/Engineering Honours (Mechanical)

"Project delivery capability is critical to the successful implementation of strategy for all organisations. Project management is now a core management discipline across all industries, from telecommunications to banking, health, defence, IT, government, engineering or construction."

Alicia Aitkin
Chief Project Officer, Finance and Strategy, Telstra

Sample course structure: Bachelor of Project Management (Civil Engineering Science)

Year 1
Degree core: Introduction to Civil Engineering
Degree core: Engineering Computing
Degree core: Introduction to Project Management
Degree core: Calculus of One Variable
Degree core: Linear Algebra
Degree core: Economics for Business Decision Making
Degree core: Statics
Degree core: Multivariable Calculus and Modelling
Degree core: Statistics
Degree core: Communications and Stakeholder Management
Year 2
Degree core: Structural Mechanics
Degree core: Introduction to Project Finance
Degree core: Data Analytics for Project Management
Degree core: Engineering Construction and Surveying
Degree core: Project Based Organisational Behaviour
Degree core: Project Quality Management
Elective: Materials*
Elective: Implementing Concurrent Projects*

Year 3
Degree core: Transport Systems
Degree core: Project Risk Management: Tools and Techniques
Degree core: Project Management Capstone Project A
Degree core: Complex Project Coordination
Degree core: Negotiating and Contracting
Degree core: Project Management Capstone Project B
Degree core: Project Variance Analysis
Project Management Option: Engineering Design and Construction

* These units are just some of the many electives available to students. Units are indicative only.

Gain experience beyond the lecture hall

Project management placements

Project management students have the option to gain important on-the-job experience by participating in industry placements that contribute to their overall degree. These opportunities demonstrate first hand to students the correct practices involved in overseeing a project, from conception through to completion. Placements may range from assisting in the delivery of a large sporting event or construction project through to the implementation of the latest software systems.

WHERE WILL YOUR DEGREE LEAD YOU?

Your degree is a launching pad into the world of engineering, computing and project management. Here is a selection of the many jobs and fields that you can explore once you graduate.

ADVANCED COMPUTING

Job title
Big data developer
Information security analyst
Software project manager
Systems analyst
Computer programmer
Web developer

Field
Health
Banking and finance
Information technologies
Government and defence
Retail

ENGINEERING (AERONAUTICAL)

Job title
Aeronautical engineer
Aerodynamicist
Design engineer
Navigation systems engineer
Automotive designer
Aircraft engineer

Field
Space industry
Aviation and aerospace industry
Agriculture
Automotive industry
Manufacturing
Defence
Mining
Construction
Farming
Agriculture
Civil aviation safety

ENGINEERING (ELECTRICAL)

Job title
Computer hardware designer
Design engineer
Power supply design engineer
Product development engineer
Substation engineer
Telecommunications engineer
Web development engineer

Field
Energy sector
Telecommunications sector
Defence
Power generation industry
Aviation and aerospace industry
Construction
Fast-moving consumer goods
Electronics industry

ENGINEERING (MECHANICAL)

Job title
Mechanical engineer
Space vehicle engineer
Biomedical implant engineer
Automated airport facilities engineer
Automotive engineer

Field
Energy sector
Health
Travel
Rail and transportation
Automotive
Mining
Manufacturing
Environment biotechnology
Power generation and energy
Construction
Air conditioning and refrigeration

ENGINEERING (BIOMEDICAL)

Job title
Design engineer
Test engineer
Quality or regulatory manager
Product support engineer
Prosthetist
Rehabilitation engineer
Chief technical officer
Sports biomechanical engineer
Tissue engineer
Forensic engineer
Clinical support specialist
Instrumentation engineer
Medical device assessor
Patent examiner
Field service engineer

Field
Health
Government
Industry
Research institutes
Health technology organisations
Medical device companies

ENGINEERING (CHEMICAL AND BIOMOLECULAR)

Job title
Energy engineer
Food engineer
Water treatment engineer
Combustion engineer
Environmental consultant
Environmental engineer
Petroleum engineer
Smelting engineer

Field
Health
Government
Production
Mining
Banking and finance
Non-government organisations

ENGINEERING (CIVIL)

Job title
Aid worker
Construction manager
Construction project manager
Façade drafter
Foundation and piling design specialist
Geotechnical consultant
Humanitarian architect
Principal transport planner
Road network system planner
Senior environmental consultant
Senior structural engineer
Supervisory emergency management specialist
Sustainability specialist
Town planner
Transport operations planner

Field
Construction
Mining
Humanitarian aid
Environmental
Transport
Coastal and marine
Agriculture
Water and public health

ENGINEERING (MECHATRONIC)

Job title
Robotics and automation engineer
Mechatronic engineer
Process monitoring and plant systems engineer
Renewable energy systems engineer
Software product development consultant
Software designer
Automobile manufacturer

Field
Robotics
Product design and development
Mining
Biotechnology
Manufacturing
Traditional and non-traditional automation
Computer system and software design
Transportation
Power systems
Defence
Agriculture
Farming

ENGINEERING (SOFTWARE)

Job title
Information security specialist
Database programmer
Software analyst
Software engineer
System test engineer
Web developer

Field
Banking and finance
Defence
Telecommunications sector
Power generation industry
Electronics industry
Fast-moving consumer goods
Healthcare
Information technologies

PROJECT MANAGEMENT

Job title
Construction project controller
Document controller
Head of projects
Program director
Project manager
Events director

Field
Construction
Mining
Humanitarian aid
Environmental
Entertainment
Banking and finance
Government
Healthcare
Business

COMBINED DEGREES

Broaden your career prospects further by combining your computing, engineering or project management degree with a second degree. By studying across other disciplines you can build your skills and be better equipped to meet the complex challenges facing industry today and into the future.

Combined degrees usually take five years to complete – this means that you can do just one extra year to attain two full qualifications, at the same annual workload of a single degree student.

Every industry values computing expertise. By combining your Bachelor of Advanced Computing with Commerce, Science, Health Science or Medical Science, you'll be able to apply your computing skills to meet the ever-changing technology needs of both established organisations and start-ups.

Team any engineering stream with another degree in Arts, Commerce, Laws, Project Management, Science, Health Science or Medical Science.

Combining engineering with commerce or project management, for example, will enable you to complement your technical and analytical skills with an understanding of business practices and the communication and coordination skills highly valued by employers.

If you're doing civil engineering, for example, you might choose to complete a second qualification in Design in Architecture. Your engineering studies will teach you to analyse the forces within a structure and to design its skeleton to support these forces, while your architectural studies will emphasise the conceptual and aesthetical aspects of the design process. You'll be an asset to both structural design and architectural companies.

"Combining my engineering degree with science gave me a balanced workload at university. It helped me learn how to focus, even when managing different tasks. It shows employers that you can be responsive to your environment and able to see the bigger picture."

Gavin Barnes
Engineering Honours (Civil)/Science graduate
Project Engineer, Lendlease

OUR SCHOLARSHIPS

The University of Sydney offers more than 50 undergraduate scholarships each year across the University. Our aim is to help you achieve your goals by giving you the financial freedom to focus on your studies and provide support to help you achieve your career goals.

The Faculty of Engineering and Information Technologies has 15 faculty scholarships, four Indigenous scholarships and a prestigious Leadership Scholarship for undergraduate students, which have a potential value of up to $1 million in total.

Leadership Scholarship Program
The Leadership Scholarship is one of the most valuable engineering, information technologies and project management undergraduate scholarships in Australia for both financial support and leadership development.

As a scholarship recipient, you will have the chance to work with some of Australia's leading firms through industry placements and have access to helpful leadership resources, networking opportunities, international collaborations and mentoring. You'll also receive $18,000 in financial support each year of your studies.

- sydney.edu.au/scholarships
- sydney.edu.au/engineering/scholarships

"I love engineering, particularly mechatronics, and this scholarship will enhance my passion by offering me valuable leadership experience throughout my degree."

Elly Williams
Engineering Honours (Mechatronic)/Science
2017 Leadership Scholarship recipient

DALYELL SCHOLARS PROGRAM

For students with exceptional academic ability who want to be challenged.

Exclusive to high-achieving students with an ATAR (or equivalent) of 98+, the Dalyell Scholars program is an opportunity to challenge yourself alongside your most promising and talented peers.

The program enables you to draw on the rich interdisciplinary depth and breadth on offer at the University, cultivating the leadership and professional expertise to join the ranks of our distinguished global alumni.

The Dalyell Scholars program allows you to collaborate and network with like-minded world influencers.

In addition to completing distinctive Dalyell units of study with other high achievers, you will have access to enrichment opportunities including:

- acceleration to master's level study
- access to specialised Language (Arts) and Mathematical Sciences (Science) programs
- exclusive research and entrepreneurship programs
- direct access to industry-based project learning
- tailored mentoring and professional skills development to enhance your study and career opportunities
- international experiences to develop your global perspective, including a global mobility scholarship.

The following courses in engineering, information technology and project management are available to study through the Dalyell Scholars program. Visit the website for a full list of the courses available.

- B Advanced Computing
- B Advanced Computing/ B Commerce
- B Advanced Computing/ B Science
- B Engineering Honours (Dalyell Scholars)
- B Engineering Honours with Space Engineering
- B Engineering Honours/B Arts
- B Engineering Honours/ B Commerce
- B Engineering Honours (Civil)/ B Design in Architecture
- B Engineering Honours/ B Project Management
- B Engineering Honours/B Science
- sydney.edu.au/dalyell-scholars

'B' for 'Bachelor of'
'M' for 'Master of'
'D' for 'Doctor of'

Who was Elsie Jean Dalyell?

A highly distinguished University of Sydney medical graduate, Elsie Jean Dalyell OBE (1881–1948) was the first full-time female academic in our Faculty of Medicine. After travelling to London on a University scholarship and serving in World War I, she conducted pioneering work with a medical team in Vienna, Austria, into childhood diseases. Her academic excellence and commitment to creating her own path are hallmarks of our Dalyell Scholars program.

Image: Elsie Jean Dalyell. Courtesy of State Records NSW: New South Wales Medical Board; NRS 9873, Photographs of doctors, 1888-1927. [Digital ID 9873_a025_a025000062] Elsie Jean Dalyell, no date

SUMMARY OF COURSES

Course name	UAC Code	ATAR/IB	Guaranteed entry in 2018*	Assumed knowledge	Duration in years
B Advanced Computing	513500	n/a	90/33	Mathematics or HSC Mathematics Extension 1	4
B Advanced Computing/ B Commerce	513505	n/a	96/38	Mathematics or HSC Mathematics Extension 1. Other assumed knowledge depends on Commerce subjects chosen.	5
B Advanced Computing/ B Science	513510	n/a	90/33	Mathematics or HSC Mathematics Extension 1. Other assumed knowledge depends on the Science areas or programs studied.	5
B Advanced Computing/ B Science (Health)	513515	n/a	90/33	Mathematics or HSC Mathematics Extension 1.	5
B Advanced Computing/ B Science (Medical Science)	513520	n/a	90/33	Mathematics or HSC Mathematics Extension 1, Chemistry and either Physics or Biology.	5
B Engineering Honours (Dalyell Scholars)	513571	98/40	98/40	Refer to relevant engineering stream	4
B Engineering Honours (Aeronautical)	513525	90/33	92/34	HSC Mathematics Extension 1 and Physics	4
B Engineering Honours (Biomedical)	513530	90/33	92/34	HSC Mathematics Extension 1, Physics and/ or Chemistry. Recommended studies: Biology	4
B Engineering Honours (Chemical and Biomolecular)	513535	90/33	92/34	HSC Mathematics Extension 1 and Chemistry	4
B Engineering Honours (Civil)	513540	90/33	92/34	HSC Mathematics Extension 1 and Physics	4
B Engineering Honours (Electrical)	513545	90/33	92/34	HSC Mathematics Extension 1 and Physics	4
B Engineering Honours (Flexible First Year)	513550	90/33	92/34	HSC Mathematics Extension 1, Physics and/or Chemistry	4
B Engineering Honours (Mechanical)	513555	90/33	92/34	HSC Mathematics Extension 1 and Physics	4
B Engineering Honours (Mechatronic)	513560	90/33	92/34	HSC Mathematics Extension 1 and Physics	4
B Engineering Honours (Software)	513565	90/33	92/34	HSC Mathematics Extension 1 and Physics	4
B Engineering Honours with Space Engineering	513570	99/42	99/42	HSC Mathematics Extension 1 and Physics	4
B Engineering Honours/B Arts	513575	90/33	92/34	HSC Mathematics Extension 1, Physics and/or Chemistry	5
B Engineering Honours/ B Commerce	513580	95/37	96/38	HSC Mathematics Extension 1, Physics and/or Chemistry	5
B Engineering Honours (Civil)/ B Design in Architecture	513585	95/37	n/a	HSC Mathematics Extension 1 and Physics. For Architecture: English (Advanced)	5
B Engineering Honours/B Laws	513800	99.5/ 43	99.5/43	HSC Mathematics Extension 1, Physics and/or Chemistry	6
B Engineering Honours/B Project Management	513590	90/33	92/34	HSC Mathematics Extension 1, Physics and/or Chemistry	5
B Engineering Honours/ B Science	513595	90/33	92/34	HSC Mathematics Extension 1, Physics and/ or Chemistry. Other assumed knowledge depends on the science programs or areas studied.	5
B Engineering Honours/ B Science (Health)	513600	90/33	92/34	HSC Mathematics Extension 1, Physics and/ or Chemistry. For the Human Movement major: Chemistry and Mathematics. Other assumed knowledge depends on the science programs or areas studied.	5
B Engineering Honours/ B Science (Medical Science)	513605	90/33	92/34	HSC Mathematics Extension 1, Chemistry and either Physics or Biology. Other assumed knowledge depends on the science programs or areas studied.	5
B Project Management	513610	85/31	88/32	HSC Mathematics Extension 1	3

*The ATAR or IB score required for entry in 2018 will be no higher than that shown as guaranteed in this table. Any student who achieves this ATAR/IB score and meets other relevant University criteria can be certain of gaining an offer if they have the course as their first preference.

HOW TO APPLY
INFORMATION FOR DOMESTIC STUDENTS*

1. Choose your course

Visit sydney.edu.au/courses

2. Check the entry requirements of the course

Admission to the University of Sydney is highly competitive. You need to meet specific academic requirements before we can make an unconditional offer of admission.

For most undergraduate courses, entry is based on your Australian Tertiary Admission Ranking (ATAR), International Baccalaureate (IB), or an accepted equivalent secondary qualification.
For details, visit:

- sydney.edu.au/study/entry-reqs

The ATAR or IB score required for entry in 2018 will be no higher than that shown as guaranteed in the table on page 49. Any student who achieves this ATAR/IB score and meets other relevant University criteria can be certain of gaining an offer if they have the course as their first preference.

Prerequisites, assumed knowledge and bridging courses
Some courses have prerequisites. The University is also introducing mathematics course prerequisites for some courses from 2019 to help students thrive in their science, technology, engineering and mathematics-related degrees and prepare them to tackle future career challenges. For more information visit:

- sydney.edu.au/study/maths

Some courses expect you to have a certain level of knowledge in areas such as mathematics, physics, biology and chemistry. Refer to the course summary table on page 46 for course-specific requirements. If you have not studied these subjects in high school, we offer bridging courses to get you up to speed.

- sydney.edu.au/ug-bridging

3. Explore your entry options

If you're not sure you'll reach the ATAR cut-off for your preferred course, visit the following website to find out if you're eligible to apply to the University through an alternative entry pathway.

- sydney.edu.au/alternative-pathways

4. Submit your application with relevant documents

As a domestic student, you need to submit your application online through the Universities Admissions Centre website:

- www.uac.edu.au

On-time applications are due by 30 September 2017. A late fee applies to applications after this date.

Apply for scholarships

The Faculty of Engineering and Information Technologies has 15 faculty scholarships, four Indigenous scholarships and a prestigious Leadership Scholarship for undergraduate students. For more details, see page 47.

Most scholarship applications are due by early October 2017, so you will apply for them around the same time you submit your university application to UAC.

Please note that deadlines and application requirements may differ depending on the scholarship.

- sydney.edu.au/scholarships

Visit us on Open Day

The best way to get a feel for the campus is to visit us on Open Day. Explore the campus, enjoy the atmosphere, and learn more about our courses and facilities by attending mini-lectures, activities and tours.

In 2017 Open Day takes place on Saturday 26 August.

- sydney.edu.au/open-day

*You are a domestic student if you are an Australian or New Zealand citizen (including dual citizens), or an Australian permanent resident or humanitarian visa holder.

HOW TO APPLY
INFORMATION FOR INTERNATIONAL STUDENTS

1. Choose your course

Visit sydney.edu.au/courses

2. Check the entry requirements of the course

Admission to the University of Sydney is highly competitive. For most undergraduate courses, entry is based on an ATAR – Australian Tertiary Admission Rank – IB (International Baccalaureate) or the equivalent from your country.

Visit sydney.edu.au/ug-it-entry

If English is not your first language, you need to demonstrate that your English language skills meet the minimum level required for your chosen course. For more information please visit:

- sydney.edu.au/ug-it-english

Prerequisites, assumed knowledge and bridging courses
Some courses have prerequisites. The University is also introducing mathematics course prerequisites for some courses from 2019 to help students thrive in their science, technology, engineering and mathematics-related degrees and prepare them to tackle future career challenges. For more information visit:

- sydney.edu.au/study/maths

Some courses expect you to have a certain level of knowledge in areas such as mathematics, physics, biology and chemistry. Refer to the course summary table on page 46 for course-specific assumed knowledge requirements. If you have not studied these subjects in high school, we offer bridging courses to get you up to speed.

- sydney.edu.au/ug-bridging

3. Submit your application

Apply through the Universities Admissions Centre (UAC) if you are completing:

- a current Australian Year 12 secondary school examination (eg, NSW Higher School Certificate, Victorian Certificate of Education, Queensland Certificate of Education) in or outside Australia
- a current International Baccalaureate (IB) diploma in Australia
- a current New Zealand Certificate of Educational Achievement (NCEA) Level 3 qualification.

The University generally participates in all the UAC international offer rounds. Refer to the UAC website for key dates.

- uac.edu.au/international

Apply directly to the University if you are an applicant not covered in the above UAC categories. To apply directly to the University, click on the 'Apply now' button on the course page:

- sydney.edu.au/courses

For important information for international students, visit:

- sydney.edu.au/student-visas

If you would like to apply through a University-approved agent, we have partnered with a range of agents and representatives who can apply to the University and make arrangements on your behalf.

- sydney.edu.au/study/admissions/apply/agents-overseas.html

PROPEL

YOUR PASSPORT TO A CAREER IN STEM

As a high school student interested in engineering, computing, science or maths, you can learn more about studying at the University of Sydney by joining us on campus at one of our many outreach activities.

The new Propel program allows you to learn about programming, robotics, project management, technology and engineering, while having lots of fun. It's the perfect opportunity to see what areas of interest excite you before you finish high school and be eligible to receive unique benefits in your first year of university study with us.

There are more than 20 activities each year for students in Years 9–12. By participating in just four of these activities while you're still in high school you could be eligible for a $2000 scholarship to study abroad once you begin your engineering, computing or project management degree at the University.

Here are just some of the upcoming on-campus activities that you can enjoy.

3-5 July Explore Engineering Workshop

The three-day Explore Engineering Workshop will show you how you can apply maths and science to everyday life and discover more about the range of disciplines and careers available in engineering. You will participate in hands-on activities, meet current engineers and engineering students and have the chance to solve a real-life engineering problem.

13-14 July Project Management Winter Camp

Designed for students in Years 10, 11 and 12, our two-day workshop will give you a headstart in project management and show you where this dynamic field can take you. You will have the opportunity to tackle real-life complex projects, learning about managing resources, people, risk and budgets, and meet current professionals and students working in this field.

You will also have the chance to visit Google, to hear about their projects and see them happening in action.

July and November: Engineering work experience

This program is developed for Year 10 students to complete during their designated work experience week. You will be teamed up with either an academic or PhD candidate and work on a project that will allow you unprecedented access to the field of engineering and technology.

You will also have the opportunity to meet current engineers and engineering students and participate in a range of activities that explore life as an engineer or technology professional.

For a full list of the eligible activities and to register for the Propel program visit our website or email engineering.outreach@sydney.edu.au

– sydney.edu.au/engineering/propel

Open Day

Join us on Saturday 26 August 2017 and get immersed in campus life for a day.

sydney.edu.au/open-day

If you read only one thing, read this.

Your journey to university is as unique as you are.

At the University of Sydney, you have the opportunity to forge your own path. You can customise your course, and get involved in extracurricular activities to personalise your uni experience

To learn more, come and see us on Open Day, call our helpline or visit our website.

Contact details
sydney.edu.au/engineering
1800 SYD UNI (1800 793 864)

Produced by Marketing and Communications, the University of Sydney, May 2017. The University reserves the right to make alterations to any information contained within this publication without notice. Forest Stewardship Council (FSC®) is a globally recognised certification overseeing all fibre sourcing standards. This provides guarantees for the consumer that products are made of woodchips from well-managed forests and other controlled sources with strict environmental, economical and social standards.

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