

SCIENCE AND ENGINEERING

A GUIDE TO UNDERGRADUATE STUDY 2021

ENGINEERING

Chemical process
Civil
Computer and
software systems
Electrical
Electrical and aerospace
Mechanical
Mechatronics
Medical

INFORMATION TECHNOLOGY

Computer science
Information systems
Games and interactive
environments

MATHEMATICS

Applied and computational
mathematics
Operations research
Statistics

SCIENCE

Biological
Chemistry
Earth
Environmental
Physics

URBAN DEVELOPMENT

Construction management
Quantity surveying and
cost engineering
Urban and regional planning



Discovering how to improve lives by solving a range of real-world problems will be crucial in the future workforce. Many of the jobs available today were unheard of a decade ago—for example, mobile app developers, big data analysts and driverless car engineers. With the rise of new technologies like blockchain, nanosensors and autonomous vehicles, the jobs of tomorrow will be redefined.

Science and engineering for a changing world

QUT courses will give you the skills to thrive in the real world.

Read on to see how we'll prepare you for the future, and explore courses and experiences that are open to you at QUT.



Take the quiz

If you are still considering your study options, there's a Match My Skills quiz you can take to find a future that matches your interests and skills.



The Queensland University of Technology (QUT) acknowledges the Turrbal and Yugara, as the First Nations owners of the lands where QUT now stands. We pay respect to their Elders, lores, customs and creation spirits. We recognise that these have always been places of teaching, research and learning. QUT acknowledges the important role Aboriginal and Torres Strait Islander people play within the QUT community.

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#1 in Australia
for scientific research and one of the fastest rising institutions in the world

2019 Nature Index



10 schools
in the faculty dedicated to driving positive change through education and research at the frontiers of STEM knowledge



50+ course options
offering you a broad range of degrees across STEM and urban development study areas



5 world-class centres
undertaking leading-edge research, and helping us adapt to a changing world



75% of future careers
will depend on STEM literacy, with an emphasis on critical-thinking and problem-solving skills



5th in Australia
85th in the world for computer science
Times Higher Education World University Rankings by Subject 2020



Top 10 in QS Rankings
in Australia for built environment, mathematics, statistics, and operations research
2019 QS Rankings by Subject



More than \$1.7 million
awarded in merit-based scholarships for undergraduate students in 2019

Preparing you for a STEM-driven world.



Make this image come alive with augmented reality.

Unlock the AR experience

- Step 1:**
Search and download the free ifeXperience app on the Apple or Google Play store.
- Step 2:**
Open the ifeXperience app. Make sure you grant the app access to your mobile device camera.
- Step 3:**
Hold your mobile device over the image while the app is active and watch the image come to life.

Saving our reef

QUT researchers Dr Luke Nothdurft and Brett Lewis are studying the impact of large amounts of sediment falling on coral colonies after tropical storms to better understand how coral responds to fragmentation and rebuilds itself. This research provides vital clues to unlocking improvements to the most efficient reef restoration methods.

Why study with us?

Think about the future. What issues do we need to address, as a society, to ensure longevity? Climate change. Water scarcity. Food shortages. Species extinction. Affordable housing.

With a predicted 75 per cent of future occupations needing STEM literacy, it means that a skilled STEM workforce is central to addressing these complex issues now and into the future.

Our future demands STEM

We know you want to change the world to make it a better place. And we're dedicated to helping you do that. Pursuing studies and a career in the areas of science, technology, engineering, mathematics (STEM) and urban development will give you the knowledge, skills and critical thinking abilities you'll need to be able to drive change into the future.

We design our courses so you graduate future focused. Our world-class lecturers will teach you the latest scientific advances and technologies, and how to apply these to some of the biggest challenges we are facing in society—challenges in agriculture and the environment, health and medical advances, technology and infrastructure, and energy and resources.

We'll also ensure you develop your problem-solving skills and critical-thinking techniques, build your confidence and capacity to be agile in grasping new opportunities, as well as help you explore your entrepreneurial nous.

In the workplace

QUT's work integrated learning (WIL) program connects you with invaluable workplace experiences. It's the perfect opportunity for putting your learning into professional practice while you gain academic credit. Through WIL, you'll network with industry professionals, experience day-to-day life in your chosen career, work on an industry-specific project from start to finish, and develop your business and personal skills. Put all together, it means you'll be more competitive when you graduate.

Relevant connections

Our longstanding relationships with leading industry partners, both domestically and internationally, offer you outstanding networking opportunities and real-world experiences including overseas internships, work experience placements and site visits.

QUT's Science and Engineering Faculty partners with prominent organisations, including:

- Airbus
- BMW Group
- CSIRO
- Energy Queensland
- Engineers Without Borders Australia
- Rio Tinto
- Technology One.

Make it your own

Whether your career focus is on combating climate change, analysing data to help save a species, developing



renewable energy systems, or designing the world's most livable city, we have the course for you.

A key feature of our courses is the flexibility of tailoring them to fit your career aspirations and interests.

Shape your degree with complementary studies—a second major allows you to develop knowledge and skills in two disciplines; or gain further insight and depth with specialised minors. Check the course pages for suggestions.

STEM double degrees also offer relevant and interesting study combinations to suit your interests and ambitions. Want to combine engineering and business? Sure! What about science and law? No problem. You'll find double degrees relevant to your area of interest at the end of each study section.

Study environments

When you study within the Science and Engineering Faculty, you will be based at Gardens Point campus,



where you will experience state-of-the-art laboratories, workshops, high-performance computing and visualisation facilities, and advanced scientific instruments all mirroring real-world environments.

You'll have access to an extensive range of electronics, kits and equipment, as well as training in PCB design, soldering, 3D printing, laser cutting and more.

Depending on your chosen course, you may find yourself:

- investigating the climate, environment, soil, water, vegetation and wildlife of a peri-urban ecosystem at the Samford Ecological Research Facility (SERF)



- exploring the molecular diversity of microbes, plants and animals in the molecular genetics research laboratory
- preparing and purifying organic and inorganic molecules for application in medicinal, materials, and supermolecular chemistry in the preparative synthesis laboratory
- designing and testing industrial control systems, avionics systems, or electrical power networks in our S Block electrical laboratories
- undertaking cross-disciplinary experiments and activities like biofuels testing, additive manufacturing, rapid prototyping, and medical robotics in our O Block Engineering Precinct.

Gardens Point campus

With more than 28 000 students, Gardens Point is a prime location in Brisbane's city centre beside the Brisbane River and City Botanic Gardens.

Facilities at Gardens Point include:

- Science and Engineering Centre
- computing and science laboratories
- launch pad for real-time prototype development
- cafés and food court
- indoor FINA-standard, 50-metre swimming pool and a gym
- esports arena
- bookshop and retail outlets
- Oodgeroo Unit
- licensed bar
- Gardens Theatre
- QUT Art Museum
- Old Government House including William Robinson Gallery
- QUT medical centre and counselling
- childcare centre.



STEM exploration

The Science and Engineering Centre, on QUT's Gardens Point campus, features The Cube—one of the world's largest digital interactive learning and display spaces, designed to provide an inspiring, explorative and participatory experience of QUT's STEM research.

Environments are replicated at a real-world scale, demonstrating real project scenarios to engage the next generation of thinkers and doers in exploring big questions of the twenty-first century.

The Cube and the centre are open to everyone. To find out what's on, visit thecube.qut.edu.au

Partnerships provide experience

Through our award-winning partnership with Brisbane City Council (BCC), we match our students with mentors and facilitate participation in BCC's Tertiary Youth Work Experience program. QUT's relationships with industry allow our students to undertake placements with a wide range of industry-leading organisations, giving you the opportunity to work on real projects. These experiences, along with authentic learning in units throughout our courses, help open doors to exciting careers in Queensland, interstate and overseas.

Mellini Sloan
QUT lecturer
Academic lead WIL placements



Scholarships and leadership

QUT offers a range of scholarships, bursaries and development programs to support you throughout your studies. Visit qut.edu.au/scholarships for full details.

Scholarships for high achievers

QUT's Excellence Scholarships and Sport Scholarships are awarded to students who have demonstrated outstanding achievement in academic, sport or creative fields. As well as financial support, students have access to leadership and development activities, and the opportunity to build professional networks.

Scholarships range in value from \$10 000 to \$30 000.

Applications close 20 November 2020.

Westpac Young Technologists Scholarship

If you are passionate about technology and its potential to change the world, this is the ideal scholarship for you. Only five universities across Australia have been selected to offer this \$15 000 scholarship which also provides the unique opportunity to become a member of the Westpac 100 Scholars Network—an inclusive group of some of the brightest technology-focused minds in education and research across Australia.

The scholarship includes a personalised enrichment program, giving you access to paid internships, inspiring mentors and an international leadership development experience.

Applications close 20 November 2020.

Women in Engineering Scholarship

The Women in Engineering Scholarship encourages and supports female students entering full-time engineering study. As a scholarship recipient, you will help build a cohort of female future leaders in engineering professions. You'll receive \$6000 paid over two years, membership to the Science and Engineering Women in Engineering program, and access to leadership and development opportunities.

Applications close 20 November 2020.

More than **\$1.7 million** awarded in merit-based scholarships in 2019

Scholarships for students experiencing financial hardship

In conjunction with the Equity Scholarships Scheme, we offer several scholarships and bursaries to support students from low-income backgrounds. Students are assessed on financial need, not academic results. All low-income students are encouraged to apply through the Equity Scholarships Scheme.

Scholarships and support for Aboriginal and Torres Strait Islander students

Aboriginal and Torres Strait Islander students commencing an eligible undergraduate degree in the Science and Engineering Faculty can apply for a range of scholarships and loan schemes to assist them throughout their studies.

Dean's Scholars Program

Our Dean's Scholars Program is our flagship leadership and development program for high-achieving students undertaking any single or double degree in the Science and Engineering Faculty.

Dean's Scholars are identified as being the future leaders and game changers in STEM.

As a Dean's Scholar, you can expect to advance your exemplary technical knowledge and more fully develop your leadership skills through industry-led experiences, international exchange programs, professional development and mentoring.

Our industry sponsors are:

- AMPC
- Boeing Australia
- Energy Queensland
- Rio Tinto
- Technology One
- Vald Performance
- Australian Centre for Robotic Vision.

Dean's Scholars are selected based on a number of personal attributes and must also maintain a consistent semester GPA of at least 6.0.

To find out more visit qut.edu.au/science-engineering/deans-scholars-program

Driving technological change

I really wanted to be an inventor when I was little and enjoyed doing STEM subjects during high school. The Westpac Young Technologists Scholarship really supported and encouraged me to get involved at university. Being part of an Australia-wide community has meant so much more than scholarship money. It's where I made many friends, mentors, and was also how I got my first degree-related job.

Vanessa Li

Anything is possible

Coming from Rockhampton, I had always dreamed of moving out and living in the big city. The Westpac Young Technologists Scholarship allowed me to move to Brisbane while helping me grow as a strong leader in tech. The Westpac 100 Scholars Network I automatically became part of made me realise that anything is truly possible. At the end of my first year, I connected with another scholar who sponsored me for a two-week study tour to Nepal through his social enterprise, to explore sustainability challenges. I've since participated in four other exchanges in Asia and Europe.

Riva Mendoza

A rewarding journey

Growing up, Ezekiel Nimpaye was a refugee of the civil war in Burundi, Africa. After he relocated to Australia, he commenced his Year 10 studies and dreamed of studying engineering.

The scholarship he received from QUT's Learning Potential Fund helped him focus on his studies.

After Ezekiel graduated in 2016, he travelled to his home village to visit his family, before starting his career with a graduate engineering role.

Peer networks and support

Join the club

University isn't just about study, it's also about getting involved and experiencing new things. You can join a range of student-led projects and clubs—QUT Aerospace, QUT Construct, Girls in Engineering Making Statements (GEMS), QUT Maths Society, QUT Motorsport, QUT Planning Student Association, Women in Science, and QUT Women in Technology are just some of the groups. Find your tribe, make new friends, connect with dedicated student communities, attend industry events, and work with your peers to make a difference. For more information visit qut.edu.au/science-engineering/study/student-clubs

Here to help

A common misconception about university is that you have to do it 'on your own'. You will be relieved to know that QUT offers many proactive and timely support services to help you succeed.

You will have access to a range of free services within your course content and outside of class including:

- language and learning support such as writing and assignment feedback, study and presentation skills
- maths, science and IT support such as understanding course content, developing STEM skills and guidance with assessment items
- career management skills that put you in charge of your future and enable you to investigate career options while building your employability
- leadership and development such as attending workshops, conferences and volunteering on campus to understand your leadership style, skills and strengths
- dedicated study spaces, tutors, cultural support and scholarships for Aboriginal and Torres Strait Islander students through the Oodgeroo Unit.

These services will help you achieve your version of success and develop your personal mindset, professional identity and academic capabilities.



Reach new heights

Medical engineering student and entrepreneur, Rob Joseph, invented a shape-shifting beanie to give snowgoers a comfortable alternative to a helmet. Soft and flexible like a beanie, the helmet has a special lining that turns into an extremely efficient shock absorber when under impact. With crowdfunding support, this will be the first product to market for ANTIordinary, the startup Rob co-founded with fellow QUT students.

We also offer bridging programs in Chemistry, Math Methods and Physics to prepare you for university studies. Bridging programs are recommended if you didn't complete the subject at school or if it's been a while since you've studied. See the course information for assumed knowledge subjects. For advice about bridging courses or interstate equivalent subjects visit qut.edu.au/assumed-knowledge

Explore your entrepreneurial side

Develop your entrepreneurial capability as part of your studies. QUT Entrepreneurship inspires and amplifies opportunities for students to realise and develop their entrepreneurial capabilities through development programs and connecting them with the innovator community. Visit qut.edu.au/entrepreneurship

QUT foundry

Why wait until you graduate to create your business, social enterprise or side hustle? QUT foundry is the perfect place to meet fellow budding entrepreneurs and like-minded students from across the university interested in learning about and practising entrepreneurship. With events like Ideas Launched, mentors and experts for you to meet, and other learning opportunities and programs, QUT foundry is the place to co-work on entrepreneurial ideas and is the hub for all things entrepreneurship at QUT.



Make a difference

I spent two weeks in Cambodia participating in a humanitarian design summit with Engineers without Borders. The opportunity to live in a remote Cambodian village really opened my eyes to the realities of people's lives around the world.

Himanthi Mendis



A moment with Miles

Miles Hatcliff

Bachelor of Games and Interactive Environments

How did you end up choosing the Bachelor of Games and Interactive Environments?

I started studying law and psychology at another university and quickly discovered that it was absolutely not for me. Instead of making a choice based on careers, I decided to go for something I had always been interested in—video games. I applied for QUT, got in, and have loved it ever since. This degree has given me so many amazing opportunities. I definitely made the right choice.

What made you choose QUT?

Well, it just made sense to go to QUT. Gardens Point campus was also much more practical for me to get to. I've made so many valuable connections studying here. The third-year students I met during my first year are now in industry roles, while the friends I've gained along the way will be forever cherished. On top of valuable insight, the teaching staff have also provided me with endless support. For example, when I came out as transgender in my second year, my professor Peta, supported me and also ensured that I felt safe and secure.

What's one uni highlight for you?

The best opportunity I've had come my way was attending the Global VR Hackathon in Shanghai, China where our team placed second. In 48 hours, we created a VR game where you steer your airship through the clouds while using cannonballs to fight off enemy sky pirates. It was an amazing opportunity to network with industry professionals in China and showcase my skills on the global stage.

Preparing you for a global career

Take the opportunity to study or work overseas while completing your course and you will gain valuable experiences that will prepare you to work globally.

We actively encourage and support you to undertake an international experience. It's an ideal opportunity to complement your QUT degree with a new study area, or boost your international and industry skills through an internship. You will also explore a new country, experience a new culture and make new friends.

Participating in an exchange program requires initiative, commitment and flexibility. These are qualities employers value highly, so the professional and personal skills you develop while overseas can give you an edge in the job market.

Potential exchange, study tour and internship destinations include:

- Austria
- Canada
- Czech Republic
- Denmark
- Finland
- France
- Hong Kong
- Ireland
- Italy
- Netherlands
- Norway
- Singapore
- South Africa
- Spain
- Sweden
- Taiwan
- United Kingdom
- United States of America.

Exchange

We have links with international institutions in 32 countries around the world. Many of these institutions are renowned for their excellence in STEM and offer a great opportunity to expand your horizons both personally and academically.

You can complete one or two semesters at a partner university and enjoy life overseas while building invaluable international connections at universities such as:

- Korea Advanced Institute of Science and Technology (Korea)
- University of Stuttgart (Germany)
- Politecnico di Milano (Italy)
- University of Copenhagen (Denmark)
- École Polytechnique de Montréal (Canada)
- Rensselaer Polytechnic Institute (USA)
- Purdue University (USA).

100+ partner institutions
80+ industry partners
30+ countries

Internships

Internships offer the best of both worlds. While you gain international experience you will also develop practical skills that will strengthen your qualifications. Choose from industry- or lab-based internships that will offer you a competitive edge in your area of interest. It's another avenue for QUT students to gain highly valuable experience.

Our students have undertaken internships with BMW, Fraunhofer, Hochtief and other industry leaders in locations around the world such as Canada, France, Germany, Hong Kong, Iceland, Japan, Norway, Turkey and the United Kingdom.

2000 international students from more than 100 countries study STEM at QUT

Short-term opportunities

Not enough time for a full semester of exchange? A short-term program, typically from one to six weeks in duration, can offer a great alternative.

These options, including study tours and language programs, are available at selected partner institutions with demonstrated strengths across the Science and Engineering Faculty disciplines.

To learn more about exchange and internship opportunities visit qut.edu.au/study/overseas-study-and-exchange



Real-world experience

I completed a six-month internship with Aesculap in Germany, the largest manufacturer of surgical instruments in the world. I worked in the research and development unit on new spinal implants, antibacterial coatings and 3D-printed materials. I learnt so much about working as a professional engineer.

Madison Rochford



(left-right) Daniel Mather—Manager International Student Mobility, QUT Global, with QUT students Benjamin Davie, Haard Shah, Gemma Price and Gerard Anton at the announcement of the 2020 New Colombo Plan Scholarships.

QUT scholars take flight with federal funding



Four Science and Engineering Faculty students are off to the Indo-Pacific region after being announced as the 2020 recipients of Australia's prestigious New Colombo Plan Scholarships.

Gemma Price, Gerard Anton, Benjamin Davie and Haard Shah were all awarded scholarships to represent Australia and QUT abroad.

The scholarship will enable them to each spend a semester or a year studying overseas and undertaking internships as part of their trip.

Benjamin will spend a semester at the Korea Advanced Institute of Science and Technology, which he hopes will lead to a career in the automotive industry.

'Having been a part of the QUT Motorsport team I have had experience in the design cycle for developing a car,' said Benjamin.

'I would be very interested in expanding this further by studying automotive-specific subjects before undertaking an internship with an automotive manufacturer. The internship will provide valuable insight into research and development at a large scale and better prepare me for integrating into the industry upon graduation.'

Gemma is enthusiastic at the thought of making new and lasting connections in her field as part of the scholarship program.

'In addition to my semester of study I intend to undertake various research internships in Singapore, and other countries as well. I am really excited to gain international experience and exposure to current research being conducted in medical engineering and biology,' Gemma said.

'As a budding researcher, this scholarship provides me with an invaluable opportunity to forge and establish relationships with potential colleagues and professional partners.'

Gerard will enrol at the University of Technology Malaysia for a semester to study naval architecture. He will also embark on an internship in Japan.

'I plan to undertake a shipbuilding internship with Mitsubishi Heavy Industries in Japan, and attend conferences like Asia Pacific Maritime Singapore to learn about new technology and upcoming trends,' Gerard said.

'While studying naval architecture at the University of Technology Malaysia I will also complete a mentorship with the Marine Technology Centre there.'

Haard will use his scholarship to take up study at Nanyang Technological University (NTU), Singapore.

'During my study at NTU, I hope to dive deeper into artificial intelligence and its emerging fields of machine learning and computer vision,' Haard said.

'I also aim to foster a mentorship relationship with researchers at the Data Science and Artificial Intelligence Research Centre at NTU to understand Singapore's research to commercial transition process. After further developing my knowledge of artificial intelligence I hope to secure an internship with VoxelCloud to assist the health industry using artificial intelligence.'

Next gen research

QUT has been recognised by top scientific journal *Nature Index* as one of the fastest-rising research institutions in the world and for good reason. The Science and Engineering Faculty is home to more ARC Laureate Fellows than most universities in Australia. And these international greats are leading research centres and programs that are investigating groundbreaking ideas to address global issues. Our researchers work in key STEM areas, aiming to solve some of the major challenges facing society and the planet such as sustainable development and climate change, energy and food security, an ageing population and chronic disease, and information dissemination and security.

Many of these leading researchers will be your lecturers. Their experience, passion and knowledge will be shared with you as part of your studies. They will inspire you to reach your potential and exceed your goals.

Research-based learning

Our research informs and enhances all aspects of our teaching. Our query-based learning approach will enhance your problem-solving and critical-thinking skills, giving you the tools needed to become a world-class investigator and researcher. Throughout your studies you will have the opportunity to learn from the researchers leading real-world research and use the facilities and equipment they use in their work.

400+ researchers
working towards new
discoveries

Preparing you to be the next gen researcher

Delve into the world of research by working with active researchers on a real project for a period of six to 10 weeks through our Vacation Research Experience Scheme (VRES).

You can take part in the program from your second year of study. You'll connect with leading researchers at hospital-based facilities, environmental living laboratories, aerospace centres and QUT-based institutes, to mention only a few.

VRES offers a challenging experience and is ideal if you're keen to investigate your potential for a career in research.

Visit qut.edu.au/science-engineering/study/real-world-learning-experiences

And if you find during the course of your studies or VRES experience that your passion for research has been ignited, you can continue on from your undergraduate degree with an honours program. Some of our courses already have honours embedded. See page 50 for more information.

Among the **top 10**
universities in Australia
for PhD completion



Helping the planet

QUT PhD candidate Mardi McNeil is part of a team carrying out the first ever assessment of how a particular type of green macroalgae, *Halimeda*, affects the marine ecosystem in the Great Barrier Reef.

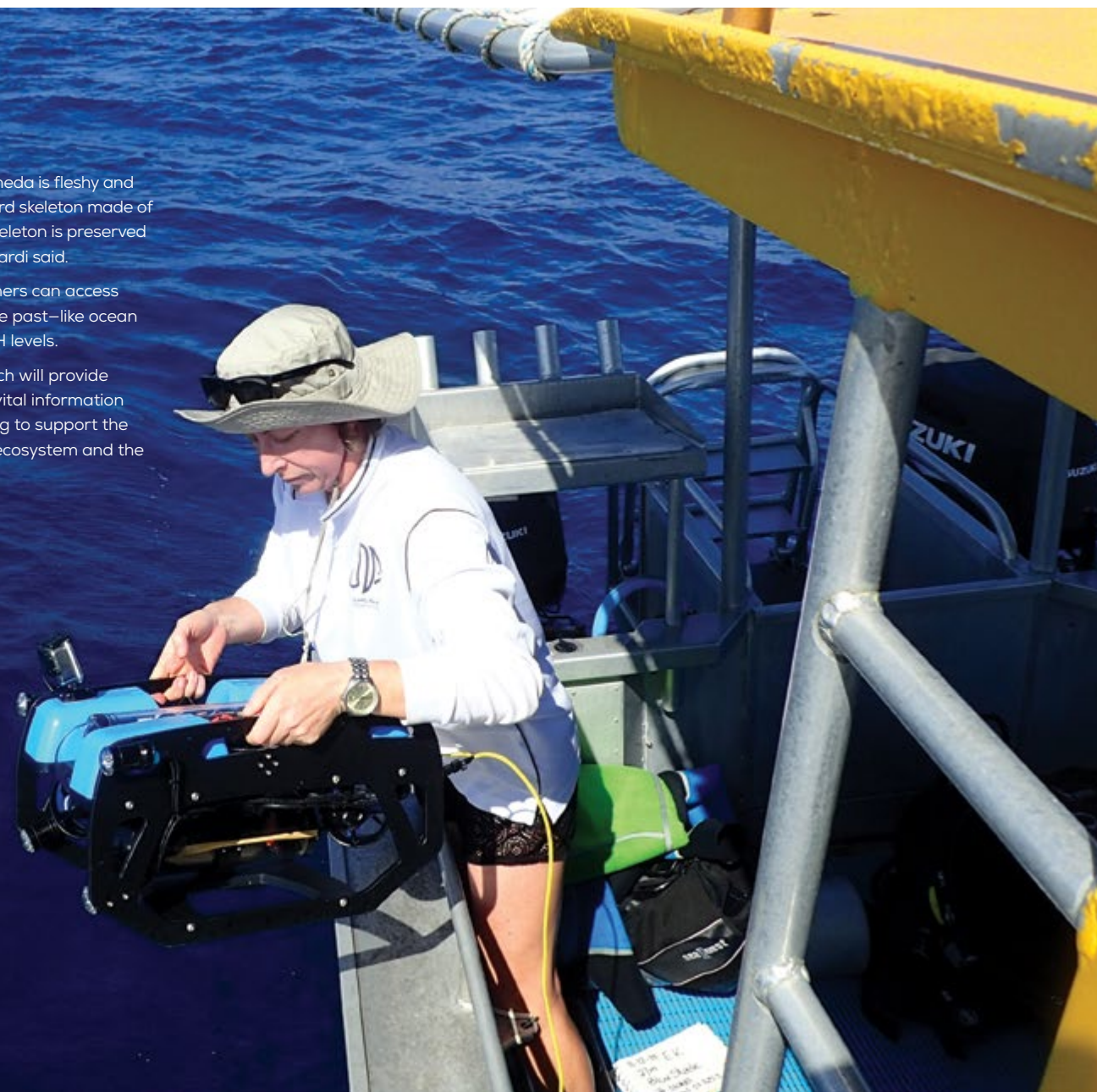
While there is much research into how coral reefs affect the flow of carbon and nutrients like nitrogen in the ocean, that's only part of the story.

Mardi says that to model the modern reef environment we need to understand how carbon and nutrients are stored and released, and how algae contributes to this complex cycle.

'On the outside, *Halimeda* is fleshy and green, but it has a hard skeleton made of limestone, and this skeleton is preserved in the fossil record,' Mardi said.

That means researchers can access information about the past—like ocean temperatures and pH levels.

'We hope this research will provide reef managers with vital information to aid decision making to support the *Halimeda* bioherms ecosystem and the reef itself.'



Research and innovation to help others

Naomi Paxton is the recipient of the 2019 Ezio Rizzardo Polymer Scholarship and the CSIRO Alumni Scholarship in Physics. She has been awarded the National Women in STEM prize and is a Vice-Chancellor's and Dean's Scholar. In 2019, she was also named the QUT Student Leader of the Year.

Naomi has established herself as a driven researcher and has published multiple articles including two in a top-ranked journal. All this, and Naomi is still studying.

'I've always loved science, so when I finished high school I applied for a science degree in physics at QUT,' Naomi said.

'As part of my studies, I was able to undertake research into astrophysics. As a result of that, I was invited to give a short presentation at TEDxQUT, which is where I met my now PhD supervisor, Professor Mia Woodruff.

'It was Mia's presentation about biofabrication which inspired me to apply for a PhD into biofabrication.

'My research aims to help patients who have lost bone as a result of accidents, birth defects or diseases such as cancer.

'We are developing solutions to 3D print bioresorbable scaffolds containing the patient's own cells through the creation of patient-specific 3D designs so the implants perfectly fit the individual patient.

'These bioactive implants will begin to rapidly regenerate the patient's own tissue while degrading, ultimately healing the bone defect.

'Combining polymer science and engineering innovations in biofabrication research has the potential to revolutionise how we treat tissue loss and improve the quality of care for patients.'



Taylah Griffin

Gangalu woman. STEM inspiration. Systems engineer.

As a proud Gangalu woman growing up in Far North Queensland, Taylah Griffin didn't have much experience travelling by plane and was intrigued by them. At QUT, she studied electrical and aerospace engineering, completing internships with Qantas and Boeing. Taylah now works on Wedgetail aircraft as a systems engineer for Boeing Defence Australia. As a recipient of the Aboriginal and Torres Strait Islander Tertiary Student STEM Achievement Award, tutor, industry presenter and STEM ambassador, she's also inspiring other Indigenous young people to study STEM.

BACHELOR OF
Engineering
(Honours)

2020 selection rank (including adjustments) 75.00 | QTAC code 412502
Campus Gardens Point | Duration 4 years full time
Assumed knowledge English, Math Methods | Offer guarantee 93.00 | Entry February and July

Engineers make things happen by developing practical solutions; many of which create impact and are of major significance to society and our way of life.

Why choose engineering at QUT?

Your QUT degree is all about real-world application grounded in solid theory—to give you the expertise to shape a better future. A combination of industry connections, student-led projects, international opportunities and access to multimillion-dollar facilities adds up to a rich and challenging learning experience.

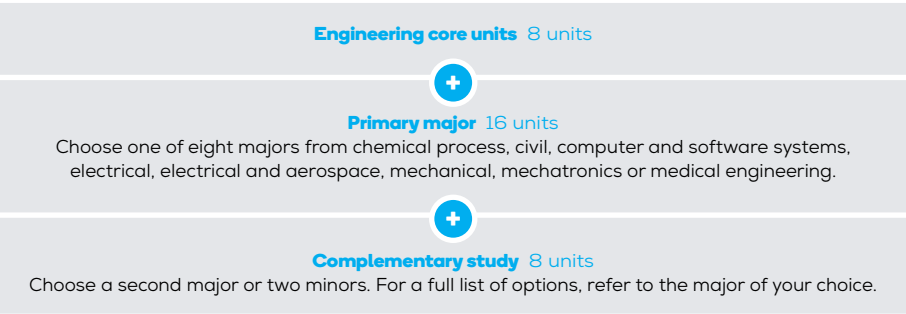
Your engineering degree

The degree features common units in the first year, giving you the opportunity to explore the full range of engineering majors before you choose your specialisation.

You can tailor your learning to the industry areas of most interest to you with a second major or two minors. A second major is a sequence of eight units complementing your major area of study. It gives you the opportunity to develop a significant depth of knowledge and skills in a second discipline area.

Or you might prefer to expand your knowledge and skills by adding to your primary major with two minors. You can choose from the engineering discipline or broaden your studies by completing minors from across the university. This might also include language studies or an international exchange. Subject area coordinators and school staff can help you choose the study plan that aligns with your career goals and passions.

Work integrated learning, internships or international study tour opportunities will help you graduate workplace ready. All engineering students complete 60 days of approved work experience in the engineering environment as a core component.



Professional recognition

QUT engineering degrees have professional accreditation from Engineers Australia (EA). EA is a signatory to the Washington Accord, which permits graduates to work in various countries across the world.

Year 12 subject scheme

QUT's Year 12 subject scheme offers a selection rank adjustment for students who complete and pass Engineering, Aerospace Systems, Specialist Mathematics, Physics, a language other than English, or university subjects in secondary school. For more information visit qut.edu.au/apply/adjustment-schemes

Pathway

If you're concerned you won't meet the ATAR/selection rank, consider a TAFE QUT dual award. Visit qut.edu.au/upgrading

The selection rank is a good indication of the equivalent ATAR. For more detail about courses and entry requirements, see pages 52–56 or visit qut.edu.au/study

MAJOR Civil

+ SECOND MAJOR (CHOOSE 1): Construction Engineering, Environmental Engineering, Structural Engineering, Transport Engineering, Aerospace, Applied Economics and Finance, Computational and Simulation Science, Computer and Software Systems, Electrical, Mathematical Sciences for Engineering, Mechanical Engineering
OR

+ MINOR (CHOOSE 2): Biotechnology for Engineers, Chemical Process Engineering, Computational and Simulation Science, Electrical Engineering, Engineering Communication, Engineering Construction, Engineering Management, Engineering Mathematics, Engineering Structures, Environmental Management, IT Breadth, Materials, Materials and Design, Mechanical Engineering, Mechanics of Machines, Physics for Engineers, Process Engineering, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering, Thermofluids

Civil engineers plan, design, construct, operate and maintain a variety of structures and facilities—from skyscrapers, power stations and factories to roads, railways and harbours. They are also involved with the assessment of the impact of projects on the natural and social environment. Civil engineers are responsible for producing safe, economical and environmentally sound infrastructure for the wider community.

Why choose this major?

Civil engineering is an industry that changes and shapes the real world. As a civil engineer, you are likely to be involved in a project from the site exploration and scope, through design and construction to completion and sustainability.

You'll develop a robust set of skills, knowledge and experience across the

spectrum of civil engineering including designing, building and maintaining man-made products and constructions, which are complemented with the development of design skills, particularly computer-aided design.

Many of our graduates have secured full-time employment even before they finished their degree as a result of their work experience performance.

Career outcomes

Civil engineers can work as a consultant or project manager, or as a municipal, structural, transport, geotechnical or water engineer. You may gain employment in government or semi-government agencies, construction firms, power generating authorities, mining firms, property development or consulting engineering firms.

What to expect

In your first year, you'll complete your common engineering units, laying the foundations for your entire degree. You'll learn engineering principles, engineering mathematics and gain an understanding of sustainability in engineering.

You will apply an understanding of construction materials to civil applications including steel design, geotechnical and water engineering, advanced concrete structures, and advanced highway engineering. Throughout your studies, you'll solidify your theoretical knowledge with hands-on experiences and projects in our labs and the Engineering Precinct.

In your final year, you will complete a major project showcasing your acquired skills. You'll also be able to put your studies into practice on the job during your work integrated learning unit.

MAJOR Chemical Process

+ SECOND MAJOR (CHOOSE 1): Aerospace, Applied Economics and Finance, Computational and Simulation Science, Computer and Software Systems, Electrical, Mathematical Sciences for Engineering, Mechanical Engineering
OR

+ MINOR (CHOOSE 2): Biotechnology for Engineers, Chemistry for Engineers, Computational and Simulation Science, Electrical Engineering, Engineering Communication, Engineering Construction, Engineering Management, Engineering Mathematics, Engineering Structures, Environmental Management, IT Breadth, Manufacturing, Materials, Materials and Design, Mechanical Engineering, Mechanics of Machines, Physics for Engineers, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering

Chemical process engineers design, develop and optimise industrial processes to make the huge range of products on which modern society depends. They may design equipment, control chemical reactions and operate industrial processes. In Australia, process engineering is the destination career for chemical engineering graduates.

Why choose this major?

Learn how to use chemistry, physics and business principles to design processes for making energy, essential products, food, and clean waste. You will develop skills to approach complex problems across multidisciplinary areas.

You'll gain real experience with work integrated learning, research projects, and site visits, with overseas opportunities.

Career outcomes

Chemical process engineers may work directly in a processing company, consulting, operations or a design office. Chemical process engineers work in a wide range of process industries that make both commodities and consumer products including oil and gas, water treatment, minerals processing, food and beverages, pharmaceuticals, paper and sugar.

What to expect

In your first year, you'll complete your common engineering units and lay the foundations for your entire degree. You'll learn engineering principles, engineering mathematics and gain an understanding of sustainability in engineering.

You will explore how quality control, process design, economics, mass-heat balance and chemistry apply to process engineering applications including advanced process modelling.

You'll gain advanced skills in thermodynamics, fluid dynamics and industrial chemistry, as well as knowledge of individual factory equipment and processes.

Experience in a specific industry, together with an in-depth understanding of process and equipment design and the completion of your final-year research projects, will round out your studies.

Graduate with confidence

QUT prepared me for career challenges by giving me in-depth background knowledge on a wide range of topics, relating them to practical, real-world examples.

As an engineering graduate at Teys Australia, I identify, develop and recommend initiatives which enhance productivity, efficiency and profitability—taking ideas through to delivery and execution. I am proud to be a member of a company that is at the forefront of research and technological developments within the red meat industry.

I am particularly enamoured by the wide range of operations that I work on at over 11 different facilities across Australia.

Luke Ward



MAJOR

Computer and Software Systems

+ SECOND MAJOR (CHOOSE 1): Aerospace, Applied Economics and Finance, Chemical Process Engineering, Computational and Simulation Science, Mathematical Sciences for Engineering, Mechanical Engineering OR

+ MINOR (CHOOSE 2): Advanced Electrical, Aerospace, Biotechnology for Engineers, Chemical Process Engineering, Computational and Simulation Science, Engineering Communication, Engineering Construction, Engineering Management, Engineering Mathematics, Engineering Structures, Environmental Management, IT Breadth, Materials, Materials and Design, Mechanical Engineering, Mechanics of Machines, Medical Engineering, Physics for Engineers, Process Engineering, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering, Thermofluids

Computer and software engineers create and modify software programs such as operating systems, applications software and communications software, as well as software embedded in devices ranging from mobile phones to GPS, satellites and aircraft flight systems.

Why choose this major?

You will graduate with a background in electrical engineering with an embedded systems specialisation, along with software design and implementation skills. This will provide opportunities to work across industries including banking and finance, government, education, transportation, entertainment, science and medicine.

Career outcomes

Software engineers are in high demand across a wide variety of industries. They may work in engineering firms, for example specialising in rail or vehicle transport, aviation, defence or construction. They may also work in information technology-specific industries in software architecture, cyber-security or as an embedded software engineer, and in organisations such as Microsoft, Google and Oracle or Brisbane's own Technology One.

What to expect

In your first year, you'll complete your common engineering units and lay the foundations for your entire degree. You'll learn engineering principles, engineering

mathematics and gain an understanding of sustainability in engineering.

Moving on with your studies, you will explore the fundamentals of electronics, circuit design, telecommunications and networking protocols. You'll develop computer programming skills, write software to solve engineering problems. You will also learn software engineering principles and modern engineering software practices, as well as microprocessors and embedded digital systems and security.

In your final year, you will complete a major project showcasing your knowledge of software engineering principles. You'll also be able to put your studies into practice on the job in your work integrated learning experience.

MAJOR

Electrical

+ SECOND MAJOR (CHOOSE 1): Aerospace, Applied Economics and Finance, Chemical Process Engineering, Computational and Simulation Science, Computer and Software Systems, Mathematical Sciences for Engineering, Mechanical Engineering OR

+ MINOR (CHOOSE 2): Advanced Electrical, Aerospace, Biotechnology for Engineers, Chemical Process Engineering, Computational and Simulation Science, Engineering Communication, Engineering Construction, Engineering Management, Engineering Mathematics, Engineering Structures, Environmental Management, IT Breadth, Materials, Materials and Design, Mechanical Engineering, Mechanics of Machines, Medical Engineering, Physics for Engineers, Process Engineering, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering, Thermofluids

Electrical engineers design, research, develop, plan, manufacture and manage electrical systems and devices which underpin modern economies and contribute to quality of life. They study and apply the physics and mathematics of electricity, electromagnetism and electronics to both large- and small-scale systems to process information and transmit energy.

Why choose this major?

QUT's strong industry links, real-world lecturers and practical focus ensure you will be work ready, with the ability to design and maintain cutting-edge products for the information and communication industries. You will develop practical skills through laboratories and design projects.

Career outcomes

Electrical engineers are employed in the power industry, robotics, manufacturing, mining and bioengineering. Opportunities are also found in the telecommunications industry, mining and transport sectors, as well as computer and transmission industries, service industries, large industrial groups and small innovative private firms.

What to expect

In your first year, you'll complete your common engineering units and lay the foundations for your entire degree. You'll learn engineering principles, engineering mathematics and gain an understanding of sustainability in engineering.

Continuing your studies, you'll develop electrical engineering knowledge and write software to solve engineering problems; and explore the fundamentals of electronics and electrical design, along with the concepts in telecommunications and software design. You will be challenged with advanced units in control, power systems, electronics, signal processing and telecommunications.

Your skills in report writing and presentation will be developed, and you will complete a major project showcasing your acquired skills. Your work integrated learning experience will help you to embed all you've learnt.

MAJOR

Electrical and Aerospace

+ SECOND MAJOR (CHOOSE 1): Applied Economics and Finance, Chemical Process Engineering, Computational and Simulation Science, Computer and Software Systems, Mathematical Sciences for Engineering, Mechanical Engineering OR

+ MINOR (CHOOSE 2): Advanced Electrical, Biotechnology for Engineers, Chemical Process Engineering, Computational and Simulation Science, Engineering Communication, Engineering Construction, Engineering Management, Engineering Mathematics, Engineering Structures, Environmental Management, IT Breadth, Materials, Materials and Design, Mechanical Engineering, Mechanics of Machines, Physics for Engineers, Process Engineering, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering, Thermofluids

Aerospace avionics engineering involves design, development, manufacture and maintenance work on the electronic systems of military and civilian aviation, defence systems, spacecraft, satellites and uninhabited aerial vehicles (UAVs). An electrical and aerospace engineer often specialises in areas such as aircraft control systems, navigation and communications, robotics or electronic systems.

Why choose this major?

QUT is a major player in national avionics research and has strong partnerships with government and industry. You will be involved in research projects such as fixed-wing UAV and rotorcraft, aerospace vision systems, aircraft control systems and autopilot design. You will gain a first-hand view of aerospace avionics, and engage with QUT engineers and researchers in the field.

Career outcomes

You may work with the Royal Australian Air Force, Royal Australian Navy, the Defence Research Centre or the Civil Aviation Authority. There are also career options with aerospace companies such as Airbus, Boeing, Australian Aerospace, Raytheon and aircraft maintenance and aeronautical consulting services, as well as in electronics, communications, process control, instrument manufacture and automotive equipment.

What to expect

In your first year, you'll complete your common engineering units and lay the foundations for your entire degree. You'll learn engineering principles, engineering mathematics and gain an understanding of sustainability in engineering.

You will become acquainted with the aerospace industry, systems engineering and aviation safety. You'll explore the fundamentals of flight, aerodynamics and performance including wind tunnel testing and flight simulations. Units focusing on both manned and unmanned aircraft systems are embedded throughout the course including basic sensing, guidance, control navigation and surveillance technologies, through to unmanned aircraft system design, build and testing. You'll learn about classical and advanced modelling, analysis and control design, and gain skills in applied estimation, path planning, and guidance and control.

You will also complete a one-year final project and a work integrated learning experience.



Real-world impact

QUT prepared me with assessments and projects with an emphasis on real-world applications that challenged my thinking. As an energy consultant I help deliver renewable energy solutions, saving councils money and bringing Australia closer to the 2030 emission reduction target. I am currently installing a geothermal power plant in Winton—Australia's first grid-connected geothermal plant to generate electricity using low temperatures. I've also conducted energy audits at 163 sites and 26 councils across Queensland and South Australia, saving over \$2.5 million annually.

Mike Fideli

MAJOR

Mechanical

+ SECOND MAJOR (CHOOSE 1): Aerospace, Applied Economics and Finance, Chemical Process Engineering, Computational and Simulation Science, Computer and Software Systems, Electrical, Mathematical Sciences for Engineering, Medical Engineering OR

+ MINOR (CHOOSE 2): Aerospace, Biotechnology for Engineers, Chemical Process Engineering, Chemistry for Engineers, Computational and Simulation Science, Computer Modelling for Engineering, Electrical Engineering, Engineering Communication, Engineering Construction, Engineering Management, Engineering Mathematics, Engineering Structures, Environmental Management, Heavy Mechanical, IT Breadth, Manufacturing, Materials, Medical Engineering, Motor Racing, Physics for Engineers, Process Engineering, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering

Focusing on the principles of force, energy and motion, mechanical engineers use their understanding of design, manufacture and operational processes to create, improve and maintain systems and machinery spanning multiple industries. Mechanical engineers keep pace with technology to enhance safety, economic vitality and sustainability. Virtually every aspect of life is touched by mechanical engineering.

Why choose this major?

You'll receive a thorough grounding in the engineering sciences and hands-on, practical experience in real-world problem solving and application of theory in a program that is strongly oriented towards industry needs. This will ensure you are fully prepared to work in every aspect of mechanical engineering.

Career outcomes

You may work in Australia and overseas in roles such as a consultant, project manager or technical adviser in industries including manufacturing, mining, refrigeration and air conditioning, transportation and mechanical handling.

What to expect

In your first year, you'll complete your common engineering units and lay the foundations for your entire degree. You'll learn engineering principles, engineering mathematics and gain an understanding of sustainability in engineering.

From there, you delve into the world of engineering science, with units in design, dynamics, fluid mechanics and mathematical fundamentals. You'll develop skills in engineering drawing. You will acquire a depth of knowledge in areas including solids modelling, materials and manufacture, instrumentation and control, thermodynamics, and stress analysis.



Transitioning from university to work

I design, build, and test hybrid rocket engines as a propulsion engineer. Working in the space sector gives me access to diverse engineering problems that I love trying to solve. The technical fundamentals gained from QUT made me feel equally capable to other skilled candidates and gave me confidence during my interviews. Even now, I still use the fundamentals QUT taught me.

Jacob Sheehy

Throughout your studies, you'll solidify your theoretical knowledge with hands-on experiences and projects in our labs and the Engineering Precinct.

Your skills in report writing and seminar presentation will be developed, and you will complete a major project showcasing your acquired skills. Your work integrated learning experience will help you to embed all you've learnt.

MAJOR

Mechatronics

+ SECOND MAJOR (CHOOSE 1): Aerospace, Applied Economics and Finance, Chemical Process Engineering, Computational and Simulation Science, Computer and Software Systems, Mathematical Sciences for Engineering, Mechanical Engineering, Medical Engineering OR

+ MINOR (CHOOSE 2): Aerospace, Biotechnology for Engineers, Chemical Process Engineering, Computational and Simulation Science, Engineering Communication, Engineering Construction, Engineering Management, Engineering Mathematics, Engineering Structures, Environmental Management, IT Breadth, Manufacturing, Materials, Materials and Design, Mechanical Engineering, Mechanics of Machines, Mechatronics Extension, Medical Engineering, Motor Racing, Physics for Engineers, Process Engineering, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering, Thermofluids

Solve real-world problems

Engineering combines all the things that I was interested in during school: maths, science, design and problem solving. Mechatronics allows me to develop my skills in these areas and apply them to building the world of the future. Over the summer holidays, I completed a 10-week undergraduate research experience through QUT's Vacation Research Experience Scheme. I worked with a senior researcher to develop the electronic control and communications systems for an autonomous surf life-saving robot that can be directed through the surf to people in distress.

Jarod Lam

Mechatronics engineering is the design and maintenance of machinery with electronic and computer control systems, such as aircraft and power generators, to work in the high-tech fields of automated systems and robotics. Typically, a mechatronic system picks up signals from the environment, processes them to generate output signals and transforms them, for example, into forces, motions and actions.

Why choose this major?

Mechatronics engineering is a growth industry, combining the disciplines of mechanical, electrical and electronic engineering, and computing. You will benefit from QUT's close links with industry and may be involved in projects with QUT Motorsport and the aerospace avionics Uninhabited Aerial Vehicle Outback Challenge.

Career outcomes

You may work as a consultant, project manager, designer or maintenance and instrumentation engineer in a wide variety of industries. These include manufacturing plants of consumer products, computer peripherals manufacturers or maintenance companies, automobile and aerospace manufacturing industries, primary production and mining, communication companies, research organisations, food and food processing industries, and software development companies.

What to expect

In your first year, you'll complete your common engineering units and lay the foundations for your entire degree. You'll learn engineering principles, engineering mathematics and gain an understanding of sustainability in engineering.

You'll move onto engineering science, with units in design, dynamics, fluid mechanics and mathematical fundamentals. You'll develop skills in technical computing, computational fluid dynamics and engineering drawing. You will acquire a depth of knowledge in areas including electronics, microprocessors and mechatronics, operations management and machines, and thermodynamics. Throughout your studies, you'll have practical experiences in our labs and workshops.

In your final year, you will gain experience in mechatronic systems design, instrumentation and control, and computer intelligence. It will culminate in an industry-based project showcasing your acquired skills, along with your work integrated learning experience.

MAJOR

Medical

- + **SECOND MAJOR (CHOOSE 1):** Aerospace, Applied Economics and Finance, Chemical Process Engineering, Computational and Simulation Science, Computer and Software Systems, Electrical, Mathematical Sciences for Engineering, Mechanical Engineering OR
- + **MINOR (CHOOSE 2):** Biotechnology for Engineers, Chemical Process Engineering, Chemistry for Engineers, Computational and Simulation Science, Computer Modelling for Engineering, Engineering Communication, Engineering Management, Engineering Mathematics, Environmental Management, IT Breadth, Manufacturing, Materials, Materials and Design, Mechanical Engineering, Mechanics of Machines, Physics for Engineers, Process Engineering, Project Collaboration, Robotics, Science and Mathematics Education, Software Engineering

Medical engineering integrates engineering principles with human physiology to design systems and products that improve the quality and effectiveness of patient care. Medical engineers design, manufacture and service medical and surgical equipment ranging from surgical instruments to implants, and assistive technologies.

Why choose this major?

You will undertake professional experience and hands-on activities such as hospital and industry site visits throughout the course. There are opportunities to be involved in industry-based projects, overseas study, work opportunities and groundbreaking research through the QUT Institute of Health and Biomedical Innovation and the QUT Medical Engineering Research Facility.

Career outcomes

Graduates find employment in hospitals as clinical biomedical engineers, in firms concerned with design, manufacture, supply and maintenance of medical, health and sporting equipment, in occupational health agencies, and in research institutions. They are involved in the design of new devices and the assessment of engineering solutions to medical problems.

What to expect

In your first year, you'll complete your common engineering units and lay the foundations for your entire degree. You'll learn engineering principles, engineering mathematics and gain an understanding of sustainability in engineering.

You'll balance your studies of engineering science—units in materials, dynamics and fluid mechanics—with human anatomy and physiology. You'll develop skills in engineering design, drawing and solid modelling. By combining engineering with human biology you'll explore biomedical engineering design, ethics, sustainability and regulation. You'll acquire knowledge and skills in areas including biomechanics, biofluids, biomaterials, stress analysis, and simulation techniques. Throughout your studies, you'll have practical experiences in our laboratories.

Your final year is your opportunity to showcase your skills with a major project. You'll embed your knowledge through your work integrated learning experience.

Improve the lives of others

When a family member received a cochlear implant, I saw how medical engineering could provide a long-term solution to his hearing loss. It was inspiring to see how engineering could be applied to the human body and better someone's life. I would love a career working to improve the health of individuals through the development and implementation of viable healthcare technology.

Renee Nightingale

Engineering double degrees

Combine a degree in	with a degree in	Career opportunities
Engineering	Architecture	By combining architecture and engineering you will open up opportunities for careers in a range of fields including architecture, project management, property development, construction or civil engineering.
	Business	With technical engineering expertise and business management skills you will be equipped to plan, design, construct and manage engineering projects. You may also work in management, finance or consulting.
	Industrial design	You will develop hands-on skills in both creating and developing innovative, attractive, sustainable and user-friendly products and systems. These skills will be highly valued across fields such as mechanical engineering, transport, service development or manufacturing.
	Information technology	Your combined skills in engineering and IT will enable you to work as an information security specialist, computer systems engineer, software engineer or electrical engineer.
	Interaction design	This future-focused course prepares you for diverse and agile career pathways in design, technology and innovation. With your combined interaction design and engineering skills you can specialise across fields including product design, product development, structural engineering, transport engineering and consultancy.
	Landscape architecture	Combine landscape architecture and engineering to create outdoor spaces with a positive cultural and environmental impact. This course will position you to work in private practice or in government at all levels, in roles such as structural engineer, geotechnical engineer, landscape architect and environmental engineer.
	Mathematics	With engineering capabilities and skills in mathematical modelling, analysis and design, you'll be well equipped to help solve complex problems in aerospace avionics, biomechanical engineering, data science, data management and research.
	Science	Depending on your major, you may find employment in energy consultancy, environmental engineering, medical engineering or natural resource management.

For more detail about courses and entry requirements, see pages 52–56 or visit qut.edu.au/study



Paying it forward

On any given week Santiago Velasquez is a QUT electrical engineering student, entrepreneur, researcher and Australian representative to the United Nations advocating disability rights. Santiago was born in Colombia with impaired vision, immigrating with his family to Australia where he could better access education and independence. As founder and CEO of EyeSyght, Santiago has made it possible for the vision impaired to access graphical content. He works in partnership with MIT alumni to drive Hailo, a system that remotely alerts bus drivers when a visually impaired person wants to board the bus. He recently attended the United Nations conference in New York to discuss how technology can be used in higher education to support students with disabilities. Case in point—Santiago's contribution led to QUT being the first university in the Southern Hemisphere to offer an electrical engineering program accessible to vision-impaired students.



Tammy Butow

Girl Geek. Startup Founder. Chaos Engineer.

I'm currently working at Gremlin in the US as a Principal Site Reliability Engineer. I break systems on purpose and make them more resilient—that's chaos engineering.

When I was a little girl, I got on the internet and thought it was the most boring place ever because it wasn't made for 11-year-old girls. I thought, 'Hey, I should build things on here.'

You should totally study tech—it's never going away. Why not be there, where you can be a pioneer in a really exciting space? That's the coolest thing ever.



Watch the video to hear more about Tammy's story.

BACHELOR OF

Information Technology

2020 selection rank (including adjustments) 70.00 | QTAC code 418801

Campus Gardens Point | Duration 3 years full time, 6 years part time²

Assumed knowledge English, Maths | Offer guarantee 87.00 | Entry February and July

Technology transforms the world. It changes the way we learn, communicate, work and enjoy life. Harness your passion for technology and build a stellar career.

Why choose information technology at QUT?

At QUT, you can build an IT qualification that satisfies your interests and supports your career aspirations. You'll learn from experts, gain hands-on experience and have opportunities for internships in Australia and overseas.

Best educational experience

QUT students rated their overall educational experience in IT at 82.5 per cent—the highest in Queensland and well above the national average (QILT Student Experience Survey 2016 and 2017).

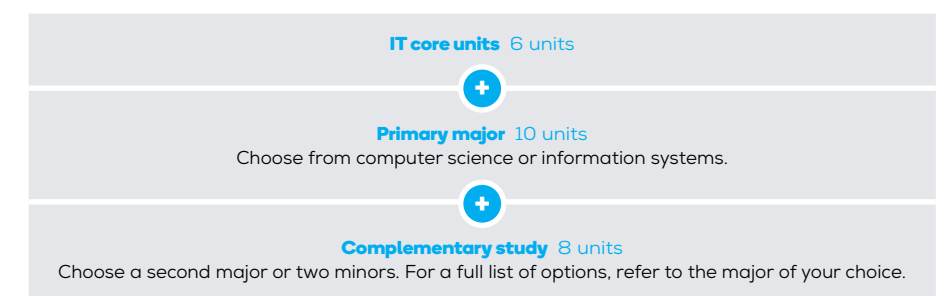
Your information technology degree

Your IT degree features common units in the first year, giving you the opportunity to explore the IT majors before you choose your specialisation.

Once you've chosen your major, you can tailor your learning to the industry areas of most interest to you with a second major or two minors. A second major gives you the opportunity to develop a significant depth of knowledge and skills in two discipline areas.

Alternatively, you might expand the breadth of your studies by adding to your major with two minors. Choose from the IT discipline or broaden your studies by completing minors from across the university to provide insights into specific areas. This might also include language studies or an international exchange. Subject area coordinators and school staff can help you choose your study plan.

Work integrated learning, internships or international study tour opportunities will ensure you graduate workplace ready.



Professional recognition

This program is accredited by the Australian Computer Society (ACS), giving eligibility for ACS membership, recognition by ACS for certification and migration skills assessment, and international recognition by signatories for the Seoul Accord.

Games and interactive environments

Our suite of IT programs also includes the Bachelor of Games and Interactive Environments. For more information see page 28.

Pathway

If you're concerned you won't meet the ATAR/selection rank, consider a TAFE QUT dual award. Visit qut.edu.au/upgrading

² The availability of evening classes is not guaranteed. The selection rank is a good indication of the equivalent ATAR. For more detail about courses and entry requirements, see pages 52–56 or visit qut.edu.au/study

MAJOR

Computer Science

+ **SECOND MAJOR (CHOOSE 1):** Computational and Simulation Science, Data Science

OR

+ **MINOR (CHOOSE 2):** Business Process Management, Computational and Simulation Science, Data-Centric Computing Extension, Enterprise Systems, Information Systems, Intelligent Systems, Mobile Applications, Networks and Security, User Experience

Computer science involves using hardware and software to design and build systems to solve complex problems or issues associated with efficiency, usability and security. It can be applied to mobile computing, artificial intelligence, robotics and large-scale information management involving information retrieval and web search engines.

Why choose this major?

You can customise your degree to suit your interests. You will learn software development and networked systems, with the opportunity to gain specific expertise in areas such as information security, networks and communications, intelligent systems, data-centric computing or user experience.

Career outcomes

Career opportunities are abundant and graduates work in roles such as software developer, systems analyst, programmer, mobile application developer, website developer, user experience designer, network administrator, security analyst, computer scientist, systems programmer or data mining specialist.

What to expect

In your first year, you'll complete your common IT units including an introduction to computer systems, learning design and build principles, and developing databases. You'll also learn programming principles.

Focusing on your major, you will develop application design and development skills, and learn discrete structures, software development and networks. You'll develop knowledge in advanced concepts of algorithms and complexity.

You will have practical, hands-on experiences throughout your course. In addition, you will have the option of further specialisations through the choice of your minors or second major.

Your final year is your opportunity to showcase your skills with a major project. Your project will be for a real-world client and will be unveiled at the IT and Games Showcase, held at the end of the year.

MAJOR

Information Systems

+ **SECOND MAJOR (CHOOSE 1):** Computational and Simulation Science, Data Science

OR

+ **MINOR (CHOOSE 2):** Business Process Management, Enterprise Systems, Mobile Applications, Computational and Simulation Science, Computer Science, Intelligent Systems, Networks and Security, Software Development for IS and Games, User Experience

Information systems focuses on identifying organisational requirements and designing effective and innovative IT systems solutions. It may involve helping managers and users clarify their needs, developing data and process models to guide the design of a system, testing and implementing enterprise-wide systems, working with large database applications and developing new digital transformation initiatives within an organisation.

Why choose this major?

Information systems gives you the knowledge and skills of an IT professional to shape the industries of the future. You will develop expertise in working with people, data, business processes and technology to find and deliver effective solutions to improve and innovate the work of individuals and organisations.

Career outcomes

You could work as a business analyst, process analyst, information systems consultant, chief technology officer, chief information officer, manager, executive or entrepreneur. Opportunities also exist in business process management, social media and mobile application development, or as information technology innovators within enterprises, consulting companies or a new startup.

What to expect

In your first year, you'll complete your common IT units, introducing you to computer systems, learning design and build principles, and developing databases. You'll also learn modelling techniques of information systems, and developing web applications.

Continuing into your second year, your major will focus on business process modelling, business analysis and managing information systems in a corporate context. You'll develop project management skills and acquire knowledge in advanced concepts of enterprise architecture.

You will have practical, hands-on experiences throughout your course. In addition, you will have the option of further specialisations through the choice of your minors or second major.

Your final year is your opportunity to showcase your skills with a major project. Your project will be for a real-world client and will be unveiled at the IT and Games Showcase, held at the end of the year.

Think creatively

I really enjoyed the spread of the first-year subjects. It gave a great grounding for choosing computer science as my major.

My final-year project, using Unreal Engine 4, and my final-year electives that taught me functional programming made me think more creatively about how I approach my coding to maximise efficiency and function—a valuable skill I need now in my job. I work in consultancy for clients around Brisbane. Every day I'm creating new apps and websites or bringing existing systems up to date. I have worked on some amazing stuff in my career so far—like augmented reality, smart geolocation—and I've been challenged by greenfield and existing projects alike. I love the diversity and continue to learn on the job.

Alexandria Griffiths

Discover your perfect combination

I am inherently a visual person and have always enjoyed applying creativity to problem solving.

QUT provided the perfect double degree for my interests and occupational market. I am now a product designer for Clipchamp. It's my responsibility to design new features for our video editing app, while creating and maintaining our design system. This role utilises the perfect blend of creativity and logical thinking.

Kelvin O'Shea

BACHELOR OF

Games and Interactive Environments

2020 selection rank (including adjustments) 70.00 | QTAC code 418102 | Campus Gardens Point | Duration 3 years full time
Assumed knowledge English, Math Methods | Offer guarantee 87.00 | Entry February

Games development is the fastest growing sector of the worldwide audiovisual market. Brisbane is a nexus of innovation for games and interactive immersive experiences, producing them for a worldwide audience and receiving international recognition.

Why choose this course?

Our degree in games and interactive environments is the most successful of its kind in Queensland, with strong connections to local games industries, as well as other industry partners in game-based technology.

This course is collaboratively taught by QUT's Science and Engineering and Creative Industries faculties, so you will learn creative, design and technology skills from experienced industry educators in their respective fields.

You will gain experience in the whole process of game and interactive media development—from initial ideas and

design to analysing products, cultural impact and industry trends, through to the development and publication of a final product.

Across all majors, you will be introduced to generic programming concepts and problem-solving strategies, team work, and the ethical and social responsibilities of an interactive media professional.

You'll also be introduced to game development from your first year of studies. You'll gain the knowledge and related skills to develop high-quality games and immersive digital experiences. In your final year, you'll work as part of a team to develop and publish your own game which will be unveiled at the IT and Games Showcase.

Career outcomes

You may find employment as an immersive systems developer (VR/AR), games programmer, games designer, simulation developer or designer,

animator, user experience specialist, application developer, quality assurance specialist, sound designer, mobile application developer, or in film and television special effects.

In addition, your strong design and programming skills can open up jobs such as web developer, digital product strategist, multimedia designer, software developer or technical officer.

Games and interactive environments
core units 6 units

+

Primary major 10 units
Choose from animation, game design, software technologies.

+

Complementary study 8 units
Two minors or one minor + elective units.

MAJOR

Animation

+ MINOR (CHOOSE 2): Advanced Animation, Entrepreneurship, Game Design, Graphic Design, Interaction Design, Marketing, Mathematics, Screen Production, Scriptwriting for Interactive Environments, Software Technologies, User Experience

What to expect

You will develop important animation skills as well as gain an in-depth understanding of the core principles, concepts and history of animation. You will learn and apply current and emerging techniques within the animation industry including motion graphics, 3D modelling and animation, real-time 3D and character animation. Through practice-based projects you will be given the opportunity to refine your skills and expand your knowledge of the animation industry.

MAJOR

Game Design

+ MINOR (CHOOSE 2): CGI, Character Animation, Entrepreneurship, Graphic Design, Interaction Design, Marketing, Mathematics, Screen Production, Scriptwriting for Interactive Environments, Software Technologies, Virtual Production

What to expect

You will receive hands-on game design experience, as well as developing a deep knowledge of narrative and immersion (drawing the player into the game), and theories of design (both general and specific to games) to provide the skills necessary to create interesting and unique game worlds. You will acquire underlying theoretical knowledge across a range of disciplines including psychology (for example, motivation) and sociology (for example, cultural impact), and become proficient at effectively communicating design ideas and proposals.

MAJOR

Software Technologies

+ MINOR (CHOOSE 2): Advanced Software Technologies, Entrepreneurship, Game Design, Graphic Design, Interaction Design, Marketing, Mathematics, Screen Production, Scriptwriting for Interactive Environments, User Experience, Virtual Production

What to expect

You will learn technological aspects of computer game development, graphics programming, games engine technology and the development of artificial intelligence for games. You will develop a deep understanding of the principles underlying modern computer graphics systems and an appreciation for how such principles help in the design and development of computer games and simulations.

Information technology and games double degrees

Combine a degree in	with a degree in	Career opportunities
Games and interactive environments	Business	You may work in roles such as project manager, production manager, producer, content manager, business development manager, product manager or marketer.
	Mathematics	Mathematics is a fundamental foundation to successful game development and design. As a gaming mathematician, you may develop and maintain creative gaming concepts through sophisticated mathematics to ensure realistic portrayals of movement. Your understanding of mathematics and ability to creatively present data also provides opportunities in data analysis, visual storytelling and communications in STEM fields.
	Science	You will have opportunities in the areas of forensic biology, geology, natural resource management, ecology and bioengineering. Use virtual reality and gaming technology to tackle issues such as soil degradation and the environmental impacts of mining, or map the spread of disease in animal populations.
Information technology	Business	Your combined skills provide opportunities for careers such as technical consultant, chief information officer, systems analyst or brand strategist.
	Creative industries	Merge the creative and imaginative with the technical to develop sophisticated and innovative digital products. You will develop a suite of complementary technology, digital media, creative, entrepreneurial and project management skills for careers involving content production, communications, graphic design and games development.
	Digital media	Capitalise on the growing demand for skilled digital media and analytical professionals with a double degree that develops transferable skills across web design, graphic design, web application development, illustration, video production and post-production, game design, project management or social media management.
	Engineering	Your combined skills in engineering and IT will enable you to work as an information security specialist, computer systems engineer, software engineer or electrical engineer.
	Interaction design	With a focus on cutting-edge design skills, knowledge and capabilities you will graduate as a contemporary designer for roles including interactive media designer, usability specialist, information architect or virtual reality designer.
	Law	You will have opportunities in the areas of cyberlaw, intellectual property and legal regulation of the internet, or work as a computer professional specialising in legal applications, information systems or security.
	Mathematics	You can apply your combined skills to fields including programming, data communications, business process management, software engineering and telecommunications.
	Science	You may work in roles including scientific modeler, software developer, scientific programmer and computational scientist.
	Secondary education	Work in a range of roles and industries applying new technologies to business or education enterprises. You can also work as a secondary school teacher in two teaching areas, one being information technology.

Make game development your career

This course helped me to develop a much deeper understanding of the industry in which I want to work. Specifically, I enjoyed learning about gamification and the surprisingly diverse range of sectors looking to apply game theory. This helped me to fully realise just how much games have to offer, as well as reinforcing my investment and excitement in my career.

QUT equips graduates with everything they need to create compelling and innovative game experiences of a highly professional standard.

Pierre Medeiros



Distinguished Professor Kerrie Mengersen

Leader. Environmentalist. Mathematician.

Distinguished Professor Kerrie Mengersen led a QUT team into the jungle to work on a pioneering project aimed at ensuring the survival of the jaguar. Working with the ARC Centre of Excellence for Mathematical and Statistical Frontiers and the Peruvian-based Lupunalus Foundation, the project combines mathematical modelling, statistics, virtual technology and indigenous knowledge to protect the big cats.

'We went into the belly of the jungle to find out as much as we could from local people and gather evidence about jaguars in this remote part of Peru. Learning about where jaguars live and hunt, their prey, and the pressures from mining, logging and other human interaction, helps us build mathematical and statistical models to make informed decisions.'

BACHELOR OF Mathematics

2020 selection rank (including adjustments) 89.00 | **QTAC code** 418701
Campus Gardens Point | **Duration** 3 years full time, 6 years part time²
Assumed knowledge English, Math Methods | **Offer guarantee** 93.00 | **Entry** February

Mathematics has the potential to solve the problems of tomorrow and is the logic behind the technology and science of today. Careers for mathematicians continue to grow—employers recognise the specialist analytical skills maths offers to tackle today’s complex scientific, computation and modelling problems.

Why choose mathematics at QUT?

As part of a high-performing group of students, you will build your skills with advanced mathematical techniques, focus on solving real-world problems, and learn from internationally recognised maths academics and researchers.

During your studies, you will use sophisticated, workplace-relevant software, giving you a solid grounding for future employment in research and industry where data analysis and modelling tools are prevalent.

Big data is big business

Data can point the way to future trends in everything from engineering to space exploration. Global businesses are increasingly in need of experts to manage, analyse and interpret large volumes of data; and make use of that data in the most effective and efficient ways.

Your mathematics degree

Our mathematics degree features common units in the first year, giving you the opportunity to explore the full range of mathematical fundamentals before you choose your specialisation.

Once you've chosen your major, you can tailor your learning to the industry areas of most interest to you with a second major or two minors. A second major gives you the opportunity to develop a significant depth of knowledge and skills in two discipline areas.

Alternatively, you might prefer to expand the breadth of your studies by adding to your major with two minors. You can choose from the mathematics discipline, or you can broaden your studies by completing minors from across the university to provide insights into specific areas. This might also include language studies or an international exchange. Subject area coordinators and school staff can help you choose your study plan.

Work integrated learning, internships or international study tour opportunities will ensure you graduate workplace ready.

Mathematics core units 8 units
+
Primary major 8 units Choose from applied and computational mathematics, operations research, or statistics.
+
Complementary study 8 units Choose a second major or two minors. For a full list of options, refer to the major of your choice.

Best jobs

US job website, CareerCast has consistently ranked maths-based careers in the 10 Best Jobs for the past seven years. In 2019, more than half of the top 10 best careers were in maths. (careercast.com/jobs-rated/best-jobs-of-2019)

² The availability of evening classes is not guaranteed. The selection rank is a good indication of the equivalent ATAR. For more detail about courses and entry requirements, see pages 52–56 or visit qut.edu.au/study

MAJOR

Applied and Computational Mathematics

- + **SECOND MAJOR (CHOOSE 1):** Accountancy, Applied Economics and Finance, Biological Sciences, Chemistry, Computational and Simulation Science, Data Science, Earth Science, Environmental Science, Operations Research, Physics, Statistics
- OR
- + **MINOR (CHOOSE 2):** Biological Sciences, Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Operations Research, Physics, Science and Mathematics Education, Statistics

Applied and computational mathematicians are at the frontline of scientific and technological advancement. Using mathematical modelling, they distil complex real-world problems into abstract mathematical frameworks, leading to new insights into the key phenomena. Furthermore, using computational mathematics these models can be used to build computer simulations, for testing 'what if' scenarios and making accurate predictions. These capabilities are instrumental in making informed decisions, particularly on global issues in areas such as health, energy and the environment.

Why choose this major?

You will combine your study of essential mathematical theory with practical application to real-world scenarios in the physical and chemical sciences,

biology, engineering and the social sciences. You will develop advanced skills in mathematical modelling and computational mathematics that will enable you to investigate, analyse and solve complex problems.

Career outcomes

You will be in high demand with career opportunities in aeronautics, business, defence, education, energy, environment, finance, health, research and development, resources, security, technology and transport.

Professional recognition

Graduates may be eligible for membership of the Australian Mathematical Society (AustMS) and ANZIAM (Australia and New Zealand Industrial and Applied Mathematics), a division of AustMS.

What to expect

In your first year, you'll complete your common mathematics units, laying the foundations for the remainder of your course. You'll explore mathematical reasoning, statistics and modelling, data analytics, computational mathematics, calculus and linear algebra.

Continuing, you'll move into more advanced studies including differential equations, computational methods, advance calculus and linear algebra. Throughout your studies you'll apply the theories and skills to real-world problems, for practical experience you can take out into the workplace.

In your final year, you'll develop knowledge in partial differential equations, advanced mathematical modelling, analysis and computational methods. You'll embed your knowledge through your work integrated learning experience.



Making sense of the nonsensical

It is often overlooked that STEM underpins nature, art, architecture, music and dance. It even provides insight into the unpredictability of human emotion. As STEM students, we make sense of the nonsensical, hearing signals through the static. I chose QUT because they have mathematics as a well-established bachelor, not just a major. The structure of the lectures and tutorials accommodates a wide variety of learning styles. The teaching staff were friendly and approachable, often with bountiful industry experience and infectious enthusiasm.

Free Sobolewski

MAJOR

Operations Research

- + **SECOND MAJOR (CHOOSE 1):** Accountancy, Applied and Computational Mathematics, Applied Economics and Finance, Biological Sciences, Chemistry, Computational and Simulation Science, Data Science, Earth Science, Environmental Science, Physics, Statistics
- OR
- + **MINOR (CHOOSE 2):** Applied and Computational Mathematics, Biological Sciences, Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Physics, Science and Mathematics Education, Statistics

Operations research deals with optimising the design and operation of complex systems relying on scarce resources such as people, machinery, materials, money and natural resources. Operations researchers develop mathematical models and algorithms to answer 'what if' scenarios and improve decision making through computational optimisation.

Why choose this major?

You will develop skills using a variety of software and advanced analytical methods such as stochastic and mathematical modelling, and mathematical optimisation. The course has a focus on practical applications across industries and processes including manufacturing, the environment and ecology, health care, infrastructure, transportation and logistics, mining and defence.

Career outcomes

You will be prepared for careers in technical fields such as operations research, management science, information technology, industrial engineering, strategic planning, systems analysis, financial analysis and actuarial science.

Professional recognition

Graduates may be eligible for membership of the Australian Society for Operations Research.

What to expect

In your first year, you'll complete your common mathematics units, laying the foundations for the remainder of your course. You'll explore mathematical reasoning, statistics and modelling, data analytics, computational mathematics, calculus and linear algebra.

Focusing on your major, you'll learn operations research methods and techniques, stochastic modelling, as well as advanced calculus and linear algebra. You'll apply theories and skills to real-world problems.

In your final year, you will develop knowledge of optimisation modelling, operations research for stochastic processes, and statistical inference. You'll embed your knowledge through your work integrated learning experience.



A uniquely mathematical approach

QUT's courses had an emphasis on practical learning. Combined with the support to find internships and work experience, I felt confident that I was both knowledgeable and employable. I love my job because every day I come to work to solve problems, something my mathematics degree taught me to manage. As an associate consultant, I use maths and associated skills to structure my thinking and answer questions relating to all types of problems. It ultimately enables me to deliver successful outcomes.

Thomas Craddock

MAJOR

Statistics

- + **SECOND MAJOR (CHOOSE 1):** Accountancy, Applied and Computational Mathematics, Applied Economics and Finance, Biological Sciences, Chemistry, Computational and Simulation Science, Data Science, Earth Science, Environmental Science, Operations Research, Physics OR
- + **MINOR (CHOOSE 2):** Applied and Computational Mathematics, Biological Sciences, Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Operations Research, Physics, Science and Mathematics Education

Statisticians are vital in helping society, industry and government make evidence-based decisions in the presence of uncertainty by collecting, organising, summarising, analysing and interpreting increasingly complex data, including big data, to produce usable information. Statisticians are specialists in applying mathematical and statistical theory, and using modern computing, to provide insights to data and reasoning around uncertainty. Because the use of statistics is prevalent across so many areas such as engineering, science, health, business and education, statisticians work with people in other disciplines and professions to solve real-world problems.

Why choose this major?

You will develop advanced statistical and analytical skills using applications and datasets from the real world.

You will gain a thorough understanding of statistical methodology that will prepare you for a career in industry, government and/or research.

Career outcomes

Career outcomes include data analyst, quantitative analyst, researcher, risk analyst and statistician. Positions of this nature are often found with employers such as the Australian Bureau of Statistics, Queensland Treasury, state and federal governments, financial institutions, CSIRO, insurance companies and medical companies.

Professional recognition

Graduates may be eligible for membership of the Statistical Society of Australia.

What to expect

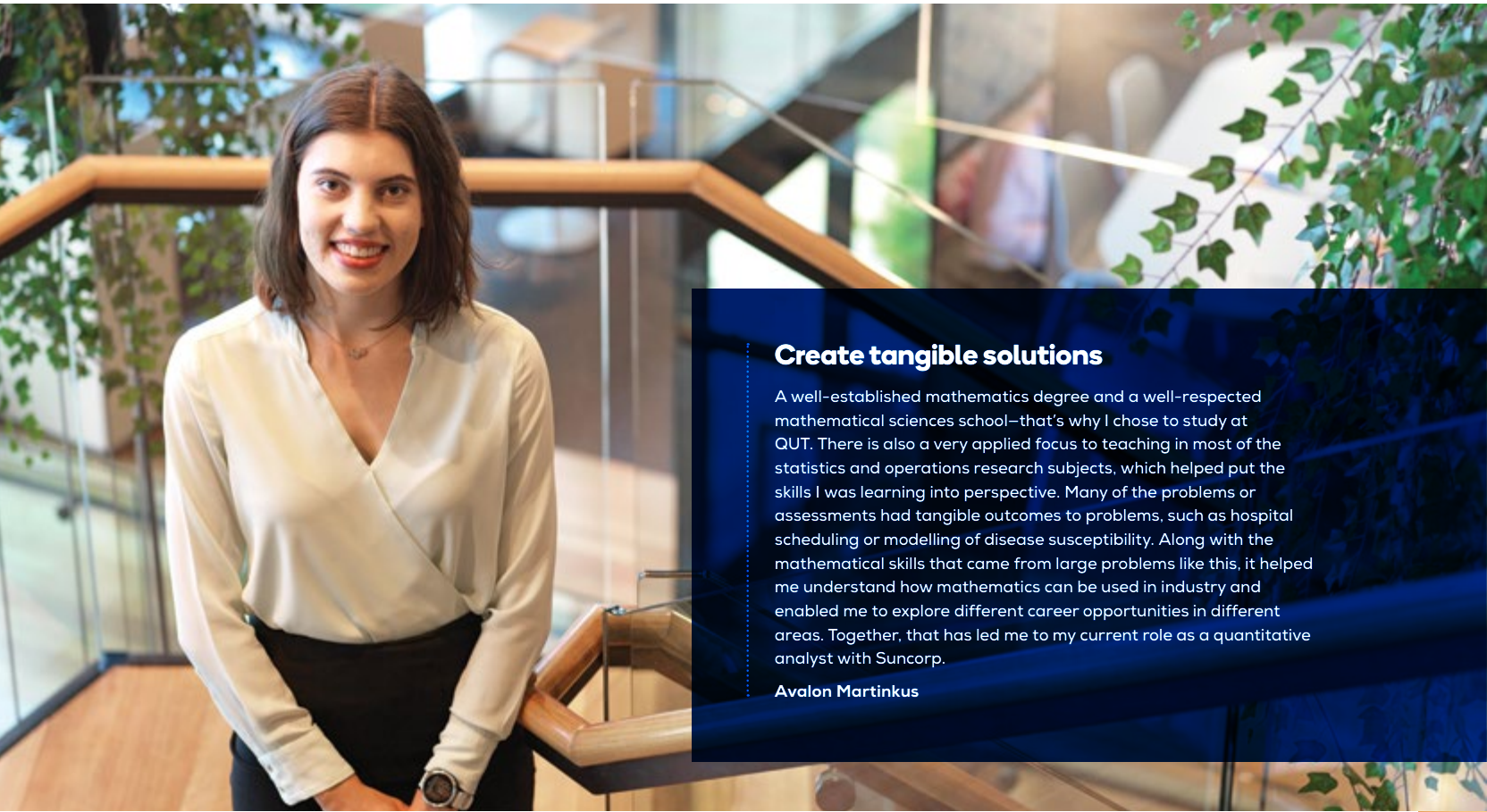
In your first year, you'll complete your common mathematics units, laying the foundations for the remainder of your course. You'll explore mathematical reasoning, statistics and modelling, data analytics, computational mathematics, calculus and linear algebra.

You'll then move onto probability and stochastic modelling, regression and design, as well as advanced calculus and linear algebra. Throughout your studies, you'll apply the theories and skills you're learning to real-world problems, for practical experience you can take out into the workplace.

In your final year, you will undertake advanced studies into statistical inference and statistical modelling. You'll embed your knowledge through your work integrated learning experience.

Mathematics double degrees

Combine a degree in	with a degree in	Career opportunities
Mathematics	Biomedical science	Combine your studies in biomedical science and mathematics to turn data analysis into real-world patient outcomes. This future-focused double degree addresses the increasing demand for biomedical science graduates with enhanced skills in applied mathematics, statistics and operations research.
	Business	Apply your combined skills to areas including finance, investment, economics, environmental management, health, marketing, logistics, defence, media education and research.
	Engineering	Your combined skills in engineering and IT will enable you to work as an information security specialist, computer systems engineer, software engineer or electrical engineer.
	Games and interactive environments	Mathematics is a fundamental foundation to successful game development and design. As a gaming mathematician, you may develop and maintain creative gaming concepts through sophisticated mathematics to ensure realistic portrayals of movement. Your understanding of mathematics and ability to creatively present data also provides opportunities in data analysis, visual storytelling and communications in STEM fields.
	Information technology	You can apply your combined skills to fields including programming, data communications, business process management, software engineering and telecommunications.
	Science	With skills in modelling analysis and design, you may work in a range of fields including natural resources, agriculture, genetics, chemistry and biochemistry, infection and disease control, bioinformatics, physical measuring and imaging techniques.
	Master of Education (Secondary)	Mathematics teachers are in high demand. You can pursue your passion for mathematics with a full degree and then fast track to a masters for your teaching qualification. The bachelor degree will provide a strong discipline base to equip you to inspire the next generation. A masters qualification will set you up to lead and shape the future of STEM education. This course combination will be offered in 2021 subject to final university approval.



Create tangible solutions

A well-established mathematics degree and a well-respected mathematical sciences school—that's why I chose to study at QUT. There is also a very applied focus to teaching in most of the statistics and operations research subjects, which helped put the skills I was learning into perspective. Many of the problems or assessments had tangible outcomes to problems, such as hospital scheduling or modelling of disease susceptibility. Along with the mathematical skills that came from large problems like this, it helped me understand how mathematics can be used in industry and enabled me to explore different career opportunities in different areas. Together, that has led me to my current role as a quantitative analyst with Suncorp.

Avalon Martinkus



Combine fields of expertise

I always loved problem solving and the fundamental concepts of maths and engineering, but I knew that I didn't want to be stuck behind a desk for my career. Working in an engineering and advisory consulting firm provides me with the balance between the technical and analytical side of engineering, with the application of real-life problems and interaction with the people involved in those problems. The group-based learning and assignments at university provided valuable experience. It taught me to work with diverse people with various aspirations on a common objective. Being able to communicate effectively with people from different backgrounds and experiences is one of the most important parts of my job today.

Ellie Hubbard



Robert Emo and Balz Kamber

PhD student. Geologist professor. Rock guys.

This geology super team is working hard to find answers locked in Earth's lower crust. While the Earth's upper crust is relatively accessible, and therefore quite well known to science, the lower part of the crust remains somewhat mysterious. Robert studies ancient rocks that were spewed up by volcanoes once active across Queensland, from as far as 30 kilometres below the Earth's surface. These volcanic rocks are the only direct samples we have of this part of the Earth, and Queensland is a unique terrain for this kind of study.

Balz says research in earth sciences has really started to pique public interest in recent years.

'We all want electric cars, solar cells, new gizmos—all of these require materials found by a geologist. We also want to know more about the climate. The only way we can predict the future climate is to know about the past.'



Read more about Robert and Balz's story.

BACHELOR OF
Science

2020 selection rank (including adjustments) 70.00 | **QTAC code** 418011
Campus Gardens Point | **Duration** 3 years full time, 6 years part time³
Assumed knowledge English, Math Methods | **Offer guarantee** 87.00
Entry February and July

A science degree will prepare you to develop solutions for challenges of global importance. Join scientists tackling climate change, long-term ecological strategy, energy and geosystems, food security and water resource management.

Why choose science at QUT?

With a QUT science degree, you'll learn how to think—not what to think. You're encouraged to question, explore and research throughout your studies. We integrate theory and practice with a strong focus on experimental design so you'll be equally skilled at the desk, in the laboratory and in the field. You'll start hands-on lab, research and fieldwork skills sessions in your first year. You will graduate with the critical-thinking and problem-solving skills needed as a scientist to thrive in today's work environment.

Your science degree

Our science degree features common units in the first year, giving you the opportunity to explore the full range of science majors before you choose your specialisation.

Once you've chosen your major, you can tailor your learning to the industry areas of most interest to you with a second major or two minors. A second major gives you the opportunity to develop a significant depth of knowledge and skills in two discipline areas.

Alternatively, you might prefer to expand the breadth of your studies by adding to your major with two minors. You can choose from the science discipline, or you can broaden your studies by completing minors from across the university to provide insights into specific areas. This might also include language studies or an international exchange. Subject area coordinators and school staff can help you choose your study plan.

Work integrated learning, internships or international study tour opportunities will ensure you graduate workplace ready.

Science core units 5 units
+
Primary major 11 units Choose from biological sciences, chemistry, earth science, environmental science or physics.
+
Complementary study 8 units Choose a second major or two minors. For a full list of options, refer to the major of your choice.

Pathway

If you're concerned you won't meet the ATAR/selection rank, consider a TAFE QUT dual award. Visit qut.edu.au/upgrading

Bachelor of Science Advanced (Honours)

The Bachelor of Science Advanced (Honours) is designed for high-achieving students demonstrating a passion for scientific enquiry in a particular area of science and who are wanting to pursue a career in scientific research. In this new, embedded honours specialised course, you can expect to study alongside a small cohort of high-achieving fellow science enthusiasts for four years. You'll be immersed in real-world research from your first year in authentic research environments, with leading QUT researchers and projects. For more information about this course visit qut.edu.au/study

³ The availability of evening classes is not guaranteed. The selection rank is a good indication of the equivalent ATAR. For more detail about courses and entry requirements, see pages 52–56 or visit qut.edu.au/study

MAJOR

Biological Sciences

+ SECOND MAJOR (CHOOSE 1): Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Human Biomolecular Sciences, Innovation and Entrepreneurship, Physics, Policy and Governance, Sustainable Environments for Health OR
+ MINOR (CHOOSE 2): Astrophysics, Biotechnology and Genetics, Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Forensic Science, Human Health and Disease, Industrial Chemistry, Innovation, Medicinal Chemistry and Biology, Physics, Science and Mathematics Education, Sustainable Environments for Health, Wildlife Ecology

The study of living things has undergone tremendous expansion in recent years, and our knowledge of cell biology, neuroscience, evolutionary biology and ecology is advancing rapidly. Biologists contribute to solutions for challenges such as food security, solving our energy crisis and saving species from extinction.

Why choose this major?

You will gain a strong foundation in the core biological sciences of cell biology, genetics, animal and plant sciences, and microbiology.

Gain experience in advanced laboratories and learn from staff at the top of their fields internationally. Guest lectures, site visits and work integrated learning opportunities provide industry connections.

Career outcomes

Laboratory-based careers include laboratory management, microbiology or molecular genetics. Field-based work often entails animal management, plant breeding, or pest and disease management. Industrial work can involve biotechnology to produce food, fuel or pharmaceuticals.

Professional recognition

You may be eligible for membership of the Australian Society for Biochemistry and Molecular Biology, the Ecological Society of Australia, the Australian Society of Horticultural Science and others.

What to expect

In your first year, you'll complete the five core units—an introduction to the principles of science. You will learn by enquiry—experimental science units will give you the grounding in

the fundamental methods of science practice, analysis, research and scientific presentation, as well as hands-on experience.

In your biological sciences major, you will explore the science of living things through cell biology and evolution, animal biology, biological processes and ecology. You'll continue your studies into plant biology, microbiology, population genetics and molecular biology.

Collaborate with your peers and educators, exploring real-world problems from multiple scientific perspectives. You will find yourself out in the field, working in the laboratory and learning about the impact of scientific discovery on people, policy, industry and the planet.

In your final year, the integrative biology project provides the valuable opportunity to showcase the skills and knowledge you have acquired throughout your degree.

MAJOR

Environmental Science

+ SECOND MAJOR (CHOOSE 1): Biological Sciences, Chemistry, Computational and Simulation Science, Earth Science, Human Biomolecular Sciences, Innovation and Entrepreneurship, Physics, Policy and Governance, Sustainable Environments for Health OR
+ MINOR (CHOOSE 2): Astrophysics, Biological Sciences, Biotechnology and Genetics, Chemistry, Computational and Simulation Science, Earth Science, Environmental Management, Forensic Science, Human Health and Disease, Industrial Chemistry, Innovation, Medicinal Chemistry and Biology, Physics, Science and Mathematics Education, Spatial Science, Sustainable Environments for Health, Wildlife Ecology

Environmental scientists undertake scientific environmental planning and management, and tackle problems such as local water quality and ecosystem impacts, soil erosion, catchment and groundwater use, or climate change.

Why choose this major?

The course provides you with hands-on skills and field experiences using real-world industry examples and methods. You will learn from guest lecturers who regularly provide advice for industry, government and community groups.

Career outcomes

Environmental scientists implement environmental surveys, analyse and interpret environmental data, and consult on the environmental impact of mining, tourism and urban development, or rehabilitation and reforestation of degraded sites.

Professional recognition

You may be eligible for membership of The Environmental Institute of Australia and New Zealand, Soil Science Australia, Clean Air Society of Australia and New Zealand, Society for Ecological Restoration Australasia, Society for Conservation Biology Oceania, Geospatial Information and Technology Association, among others.

What you'll learn

In year one, you'll complete the five core units—an introduction to the principles of science. You will learn by enquiry—experimental science units will give you the grounding in the fundamental methods of science practice, analysis, research and scientific presentation, as well as hands-on experience.

In your major, an introduction to the earth, ecosystems and the environment

will set the tone for the rest of your studies. You'll explore geospatial information science, environmental pollution and ecology. You'll continue your studies with soil science, conservation biology and groundwater systems.

Collaborate with your peers and educators in well-equipped learning environments, exploring real-world problems from multiple scientific perspectives. You will find yourself out in the field, working in the laboratory and learning about the impact of scientific discovery on people, policy, industry and the planet.

In your final year, you will investigate case studies in environmental science as a major project to showcase the skills and knowledge you've acquired during your studies.

MAJOR

Earth Science

+ SECOND MAJOR (CHOOSE 1): Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Human Biomolecular Sciences, Innovation and Entrepreneurship, Physics, Policy and Governance, Sustainable Environments for Health OR
+ MINOR (CHOOSE 2): Astrophysics, Biotechnology and Genetics, Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Forensic Science, Human Health and Disease, Industrial Chemistry, Innovation, Medicinal Chemistry and Biology, Physics, Science and Mathematics Education, Sustainable Environments for Health, Wildlife Ecology

Earth science is fundamental to most critical issues facing the health of our planet such as the supply of energy, minerals and water for technological advancement and a growing population, and the management and mitigation of climate change and natural hazards. Earth scientists work to understand the Earth's processes, monitor changes and decipher its past to help predict the future.

Why choose this major?

This course blends the traditional fields of geology, physical geography and oceanography/hydrology. You will explore current research issues with theory and industry-related, hands-on field, laboratory and modelling work to identify possible solutions. You will gain the fundamental knowledge and skills to pursue a career in the resource, environmental or research sectors.

Career outcomes

Graduates may be employed in the industrial, government, and academic or education sectors. There is also demand in the energy, exploration and mining sectors, as well as in environmental consulting companies tackling geotechnical, groundwater contamination, natural hazards or climate change issues.

Professional recognition

Graduates are eligible for membership of several professional societies such as the Geological Society of Australia, Australian Institute of Geologists and other overseas professional societies.

What to expect

In your first year, you'll complete the five core units—an introduction to the principles of science. You will learn by enquiry—experimental science units will give you the grounding in the fundamental methods of science practice, analysis, research and scientific presentation, as well as hands-on experience.

Your earth science major begins with the fundamental driving forces of life and planetary evolution. You'll continue your studies with marine geoscience, sedimentary geology and stratigraphy, and explore natural hazards and structural geology.

You'll round out your experience with units in geophysical and plate tectonics, and basin analysis. You'll also complete a major project to showcase the skills and knowledge you have acquired during your degree.

Throughout your course you will collaborate with your peers and teaching staff in QUT's well-equipped learning environments. You will explore real-world problems from multiple scientific perspectives and learn the tools of the trade. You will find yourself out in the field, working in the laboratory and learning about the impact of scientific discovery on people, policy, industry and the planet.



Get outdoors

Kat Gioseffi is working in a graduate position as an operations geologist with natural gas company, Santos.

'Geology's about the outdoors—learning from rocks and landscapes—and QUT offers trips every semester. We travelled the north and south Queensland coast, the southern coast of New South Wales and the Flinders Ranges in South Australia.

And I was blown away by how involved the lecturers were with students. They always made time, even outside of classes, to answer your questions and help develop you as a scientist.'

MAJOR

Chemistry

+ SECOND MAJOR (CHOOSE 1): Biological Sciences, Computational and Simulation Science, Earth Science, Human Biomolecular Sciences, Innovation and Entrepreneurship, Physics, Policy and Governance, Sustainable Environments for Health OR

+ MINOR (CHOOSE 2): Analytical Chemistry Extension, Astrophysics, Biological Sciences, Biotechnology and Genetics, Computational and Simulation Science, Earth Science, Environmental Science, Forensic Science, Human Health and Disease, Industrial Chemistry, Innovation, Medicinal Chemistry and Biology, Nanotechnology, Physics, Science and Mathematics Education, Sustainable Environments for Health, Wildlife Ecology

Chemists are involved in most areas of science, technology, environment and industry. At QUT you will study analytical, physical, organic and inorganic chemistry, and focus on modern applications such as nanotechnology, analytical chemistry and spectroscopy.

Why choose this major?

QUT's chemistry degree is known and respected. Many employers prefer QUT graduates, especially those with an analytical chemistry minor because of their advanced technical skills and training in modern instrumentation and scientific communication. You will undertake comprehensive laboratory work in this course.

Career outcomes

You may work as an industrial chemist, materials scientist, environmental chemist, quality control analyst, laboratory supervisor, food chemist or an organic/inorganic chemist. Other areas include drug development, clay and minerals chemistry, renewable energy sources, nanotechnology, environmental monitoring and applications of modern analytical instrumentation. QUT graduates are also sought after by police and other forensics laboratories.

Professional recognition

Graduates of the chemistry major with the chemistry for industry second major are eligible for membership of the Royal Australian Chemical Institute.

What to expect

In your first year, you'll complete the five core units—an introduction to the principles of science. You will learn by enquiry—experimental science units will give you the grounding in the fundamental methods of science practice, analysis, research and scientific presentation, as well as hands-on experience.

You will begin your focus on chemistry with an introduction to chemistry, as well as calculus and algebra. From there, you'll continue your studies into analytical, inorganic, organic and physical chemistry. You will learn strategies for synthesis and applied physical chemistry.

Throughout your course you will collaborate with your peers and teaching staff in QUT's well-equipped learning environments. You will spend time in our laboratories, exploring real-

world problems from multiple scientific perspectives and learning key lab skills.

In your final year, you'll explore fascinating topics of current international research interest including organometallic compounds, bioinorganic chemistry, coordination polymers, metal-organic-frameworks (MOFs) and other metallo-supramolecular species. You'll also complete a major project to showcase the skills and knowledge you have acquired throughout your degree.



Learn through experiences

I've enjoyed the practical components of my third-year subjects. We are given a lot more freedom to plan and conduct experiments and I find this allows me to appreciate the theory on a deeper level. All of my lecturers are more than willing to help connect students with potential internship and employment opportunities. I am currently completing an internship within the chemistry lab at Caltex; an opportunity I might not have considered had my lecturer not suggested it to me.

Charlotte Woods

MAJOR

Physics

+ SECOND MAJOR (CHOOSE 1): Biological Sciences, Chemistry, Computational and Simulation Science, Earth Science, Environmental Science, Human Biomolecular Sciences, Innovation and Entrepreneurship, Policy and Governance, Sustainable Environments for Health OR

+ MINOR (CHOOSE 2): Astrophysics, Biological Sciences, Biotechnology and Genetics, Computational and Simulation Science, Earth Science, Environmental Science, Forensic Science, Human Health and Disease, Industrial Chemistry, Innovation, Medicinal Chemistry and Biology, Nanotechnology, Science and Mathematics Education, Sustainable Environments for Health, Wildlife Ecology

Physicists contribute to solutions for global challenges in all facets of modern life through the development of instruments for environmental monitoring, computer models for climate change prediction, and solar and renewable energy systems. They also improve access to information processing through quantum computing, nanotechnology, lasers and photonics.

Why choose this major?

Each unit of your studies is supported by experimental work, so you will spend significant time in the teaching laboratories.

In your final year you will undertake research through the Physics Research unit. Areas of specialisation include electromagnetism, lasers and optics, medical physics, computational physics, nuclear and radiation physics, astronomy and astrophysics, thermodynamics, quantum mechanics and relativity, materials science, surface science, and nanotechnology.

Career outcomes

Physicists are employed in research and development, management or consulting in manufacturing companies, mining and exploration companies, research institutions such as CSIRO and the Defence Science and Technology Organisation, government bodies, environmental protection and health departments, schools, universities and hospitals. Their inquisitive attitude and skills in data analysis makes physicists good candidates for employment in banks and financial institutions.

Professional recognition

Graduates are eligible for membership of the Australian Institute of Physics, dependent on their choice of study options.

What to expect

In your first year, you'll complete the five core units—an introduction to the principles of science. You will learn by enquiry—experimental science units will give you the grounding in the fundamental methods of science practice, analysis, research, and scientific presentation, as well as hands-on experience.

Begin your physics studies with the fundamental concepts of physics which seek to describe, predict and explain phenomena at all scales—from the observable universe down to subatomic particles. In the second year, you will learn how to think about scientific concepts and solve problems like a physicist. You'll explore mathematical methods, experimental physics and electromagnetism.

In your final year, your studies will include materials and thermal physics, classical and quantum physics, and nuclear and particle physics. You'll also complete a major research project to showcase the skills and knowledge you have acquired throughout your degree.

A natural complement to your physics degree is to engage in research opportunities—whether that is through the Vacation Research Experience Scheme (VRES) or by continuing on to an honours degree. Either, or both, will give your future career a boost, by learning advanced topics and tackling a real research project alongside an experienced researcher.



Feed your curiosity

Physics gives us a language and a framework to describe the world around us. It helps us give structure to our curiosity. Through physics, we can understand why things are the way they are, and we can make informed predictions about the future. At QUT, our students develop key competencies including analytical, problem-solving, numeracy and computational skills. They are agile thinkers, uniquely poised to understand complex systems and address emerging challenges in all facets of modern life.

Associate Professor Jennifer McLeod

Science double degrees

Combine a degree in	with a degree in	Career opportunities
Science	Business	Gain employment as a consultant, laboratory manager, venture capitalist financier, marketer or project manager within firms developing and taking scientific research to the marketplace.
	Engineering	You may find employment in energy consultancy, environmental engineering, medical engineering or natural resource management.
	Games and interactive environments	You will have opportunities in the areas of forensic biology, geology, natural resource management, ecology and bioengineering. Use virtual reality and gaming technology to tackle issues such as soil degradation and the environmental impacts of mining, or map the spread of disease in animal populations.
	Information technology	You may work in roles including scientific modeller, software developer, scientific programmer and computational scientist.
	Journalism	Skilled communicators who can frame scientific knowledge for broad public consumption are in high demand. Use your skills to communicate science across a variety of platforms including social, online, print and broadcast in both the public and private sectors.
	Landscape architecture	Combine landscape architecture with science to enhance your understanding of environmental impacts of mining, tourism and urban development. With this understanding, you'll be equipped to rehabilitate and reforest degraded sites, or design outdoor spaces that enhance the environment.
	Law	You may work in careers involving inventions, trade secrets, quantitative evidence, genetic modification and environmental law.
	Mathematics	With skills in modelling analysis and design, you may work in a range of fields including natural resources, agriculture, genetics, chemistry and biochemistry, infection and disease control, bioinformatics, physical measuring and imaging techniques.
	Professional communication	Your skills in effective visual, speech and written communication will help you frame scientific knowledge for a broad range of audiences or give you the option to work across corporate, policy and government sectors with the expertise to communicate scientific concepts, research and outcomes.
Environmental science	Master of Education (Secondary)	Science teachers are in high demand. You can pursue your passion for science with a full degree and then fast track to a masters for your teaching qualification. The bachelor degree will provide a strong discipline base to equip you to inspire the next generation. A masters qualification will set you up to lead and shape the future of STEM education. This course combination will be offered in 2021 subject to final university approval.
	Urban and regional planning	Combine your keen interest in environmental science with urban and regional planning to ensure the sustainable and efficient use of land and natural resources to balance and enhance environmental and societal needs.

Other science options

If you're interested in exploring other QUT science courses, make sure you check out the Bachelor of Biomedical Science in the Faculty of Health. Biomedical scientists study how the body works, investigate how disease or injury interferes with normal function, and develop new treatment strategies to help restore function. For more information about this course, and other health science courses, visit qut.edu.au/study



A woman to watch

Evangeline Corcoran is a PhD candidate and conducts research as part of the Quantitative Applied Spatial Ecology (QASE) lab. She applies maths, statistics and new technologies to ecological problems such as monitoring threatened species. On top of her research, she teaches undergraduate classes in experimental design and statistical analysis.

'I took this chance to be a part of a really exciting and cutting-edge interdisciplinary project, scholarship opportunities, great mentorship, and the ability to work and study close to family,' she said.

Dr Simon Denman and Dr Grant Hamilton are also part of her team. Together, they are combining machine learning and thermal imaging with drones to count wildlife in a way that is faster, more accurate, and less invasive than traditional methods.

'My supervisors give me guidance when I need it, but also freedom to pursue my own ideas and take ownership of my thesis project'.

The main project she is working on involves developing new and improved monitoring and population modelling methods for threatened koalas using drones, thermal imaging and machine learning. This project also has wider implications for researching and managing other animal populations.

'I enjoy working on a project that has very practical applications,' Evangeline said.

As well as having a supportive environment, the project's interdisciplinary nature provides a lot of opportunities to explore different aspects of research. This has included teaching, presenting at academic and industry conferences, and writing.

'A highlight was publishing my first lead author paper and receiving international honours as a 'Woman to Watch' in the drone industry for my role in this research.'





Rachel Mawn

Optimist. Renovation whiz. New Yorker.

I moved to New York recently after graduating and now manage high-end residential construction projects. My main focus is full gut apartment renovations, most of which have Central Park and Manhattan skyline views. I chose to study urban development with a major in quantity surveying and cost engineering as I've always been intrigued by the complex logistics, problem solving and mass scale of construction. QUT taught me that opportunities will always be available if you work hard and are open to them.

BACHELOR OF

Urban Development (Honours)

Whether you want to deliver sustainable environments for a growing population or advise on the use, value, and management of property, there is considerable employment demand for urban development professionals.

Why choose urban development at QUT?

Our industry connections mean your studies are innovative and relevant, mirroring trends and developments in the field. The integrated honours year allows you to further develop your skills, get real experience and make industry contacts before graduating with an advanced qualification.

We are connected, and so are you

QUT is proud to be a research partner with the Sustainable Built Environment National Research Centre. QUT also hosts the Construction Industry Institute of Australia, which is focused on the needs of the property, design, construction and facility management sectors. These real-world connections mean your qualification addresses the most current and emerging issues.

Prepared for your career

You will go on field trips, participate in site visits and undertake industry placement. In your final year, you will complete a significant research project, integrating all of the skills you've learnt throughout your degree.

Your urban development degree

Our industry-informed course offers three majors for you to choose from depending on your area of interest and career aspirations in the field. With most of the world's population now living in urban areas, there is demand for urban development graduates with expertise in delivering sustainable living environments.

You can also tailor your learning to the industry areas of most interest to you with a second major or two minors. A second major gives you the opportunity to develop a significant depth of knowledge and skills in an additional discipline.

Alternatively, you might prefer to expand the breadth of your studies by adding to your major with two minors. You can choose from other built environment disciplines, or you can broaden your studies by completing minors from across the university to provide insights into specific areas. This might also include language studies or an international exchange. Subject area coordinators and school staff can help you choose your study plan.

Our professional practice unit, internships or international study tour opportunities will ensure you graduate workplace ready.

Urban development core units 6 units



Primary major 18 units

Choose from construction management, quantity surveying and cost engineering, or urban and regional planning.



Complementary study 8 units

Choose a second major or two minors. For a full list of options, refer to the major of your choice.

Pathway

If you're concerned you won't meet the ATAR/selection rank, consider a TAFE QUT dual award. Visit qut.edu.au/upgrading

MAJOR

Construction Management

2020 selection rank (including adjustments) 70.00 | **QTAC code** 412312 | **Campus** Gardens Point
Duration 4 years full time, 8 years part time² | **Assumed knowledge** English, Maths | **Offer guarantee** 93.00 | **Entry** February and July

+ **SECOND MAJOR (CHOOSE 1):** Accountancy, Applied Economics and Finance, Architectural Studies, Property, Urban and Regional Planning Studies, or a range of options from across QUT
 OR

+ **MINOR (CHOOSE 2):** Property Development, Property Investment and Finance, Urban and Regional Planning Studies, or a range of options from across QUT

Construction managers coordinate and supervise the construction of large building projects such as apartments, office blocks, commercial buildings, schools and hospitals. They organise subcontractors and equipment, estimate costs and quantities of materials needed, plan construction methods and procedures, and ensure quality, cost and safety standards are met.

Why choose this major?

QUT's construction management course is considered one of the best in Australia and is highly ranked internationally. Teaching staff have real-world experience and maintain engagement with industry professionals and organisations. Lectures and tutorials are often delivered by the industry's best frontline professionals. You will also undertake professional practice, work on case studies and attend site visits to gain hands-on experience.

You will complete 30 days of approved construction management work experience as part of your professional practice component.

Career outcomes

You may be employed in private organisations such as large construction and development companies, consultancies or government departments.

Professional recognition

The course has professional accreditation by the Australian Institute of Building.

What to expect

In your first year, you'll complete units that will lay the foundations for the remainder of your course. You'll explore design thinking for the built environment and receive an introduction to construction management, structures and residential construction, urban development economics and law, and integrated construction.

Moving into a focus on your major, you'll complete units in commercial construction, construction-related law, and building services engineering. You'll learn about building measurement and estimating, and develop your design and building skills.

In your final year, you will explore programming and scheduling. You'll gain an understanding of strategic construction management, developing key skills relevant to your career.

Throughout your studies, you'll be applying what you learn to real-world projects. You'll also have access to site visits and industry speakers. The opportunity to demonstrate your acquired knowledge through your work integrated learning experience will provide valuable professional experience.



Work ready

My lecturers always aim to make learning interactive, collaborative and interesting. Incorporating real-world examples allows students to associate theoretical concepts with practical application. I am confident QUT has instilled me with the problem-solving skills and knowledge to become a valuable work-ready graduate. At the end of the year, I will be graduating with a degree with honours, an honours thesis and a graduate position at Multiplex Constructions. Without QUT I would not be in the place I am today.

Olivia Vasilakis

MAJOR

Quantity Surveying and Cost Engineering

2020 selection rank (including adjustments) 70.00 | **QTAC code** 412312 | **Campus** Gardens Point
Duration 4 years full time, 8 years part time² | **Assumed knowledge** English, Maths | **Offer guarantee** 93.00 | **Entry** February and July

+ **SECOND MAJOR (CHOOSE 1):** Accountancy, Applied Economics and Finance, Architectural Studies, Property, Urban and Regional Planning Studies
 OR

+ **MINOR (CHOOSE 2):** Property Development, Property Investment and Finance, Urban and Regional Planning Studies

Quantity surveyors and cost engineers provide advice to the construction industry on the financial and legal aspects of construction and the operation of existing buildings. They may also be involved with the resources, energy and infrastructure sectors advising on and managing cost.

Why choose this major?

QUT offers the only specialist quantity surveying and cost engineering degree in Australia. You will graduate job-ready with comprehensive industry knowledge. You will gain practical experience with field trips, site visits, and work integrated learning. You can personalise your studies through a second major or minor units to match your career aspirations and interests.

You will complete 30 days of approved work experience within the industry as part of your work integrated learning.

Career outcomes

Graduates are employed on major public or private construction projects in the areas of contracts, planning and scheduling, estimating and cost controls, risk management, and supply chain and procurement. You may find employment with quantity surveying firms, engineering and project management firms, government departments or authorities, building contractors, financiers or property developers.

What to expect

In your first year, you'll complete your common units, laying the foundations for the remainder of your course. You'll explore the built environment, and receive an introduction to construction management, structures and residential construction, urban development economics and law, and integrated construction.

From there, your studies will prepare you to provide professional advice to the construction industry on the financial and legal aspects of new constructions, as well as the operation of existing buildings. You will learn complex construction techniques and methodologies, business skills—including management issues, contract administration, and cost planning and controls. You will gain an in-depth understanding of commercial construction, measurement, estimating and services, and heavy engineering.

In your final year, you will explore advanced concepts of quantity surveying and cost engineering. You'll gain an understanding of construction legislation and risk management in the energy and resources sectors. Your studies will culminate in a major research project showcasing your acquired skills.

Throughout your studies, you'll be applying what you learn to real-world projects. You'll also have access to site visits and industry speakers. You will complete 30 days of work experience through your work integrated learning unit.

Professional recognition

The course has accreditations with the Australian Institute of Quantity Surveyors and the Royal Institution of Chartered Surveyors.

Applying for this course

Apply for the Bachelor of Urban Development (Honours) (Construction Management), QTAC code 412312. Your first year will provide you with important foundation units and from second semester you will specialise in quantity surveying and cost engineering to graduate with a Bachelor of Urban Development (Honours) (Quantity Surveying and Cost Engineering).

Real-world opportunities

My final-year thesis project has been the most exciting project I have worked on to date. Taking a real-world issue and finding a practical and reasonable solution has been so gratifying. Attending a world congress in Singapore was a true honour and provided fascinating insights into my field of study.

Maddison Granzin

The best thing about the lecturers at QUT is their evident drive to achieve the best for their students. They treat you as a colleague in the planning field. There are also guest lecturers, tutors and academics who help provide a real-world perspective on course work.

Chelsea Winn

² The availability of evening classes is not guaranteed.

The selection rank is a good indication of the equivalent ATAR. For more detail about courses and entry requirements, see pages 52-56 or visit qut.edu.au/study

MAJOR

Urban and Regional Planning

2020 selection rank (including adjustments) 70.00 | QTAC code 412352 | Campus Gardens Point
Duration 4 years full time, 8 years part time² | Assumed knowledge English | Offer guarantee 93.00 | Entry February and July

- + **SECOND MAJOR (CHOOSE 1):** Accountancy, Applied Economics and Finance, Architectural Studies, Property, Urban Development Construction, Landscape Architecture OR
- + **MINOR (CHOOSE 2):** Project Collaboration, Environmental Management, Residential Construction, Property Development, Mandarin, Interactive and Visual Design, Public Relations, or a range of options from across QUT

Urban and regional planners design and manage the use of land and natural resources to meet societal and environmental needs in a sustainable way. They plan large-scale projects such as regions, cities, suburbs, ports, recreational and industrial areas, and transport routes.

Why choose this major?

QUT is recognised for combining community involvement with design and implementation. You will work on projects run in collaboration with local and state government partners, developers and local community groups. You can complement your planning knowledge with studies in a range of fields, including architecture, environmental science, landscape architecture, health, law or business.

Throughout your studies, you'll have access to site visits and industry speakers, and build skills in industry-relevant software.

You will complete 30 days of approved work experience in the industry, as part of your work integrated learning.

Career outcomes

You will have international and local employment opportunities. You could work in state and local government departments and agencies, development companies and professional planning consultancies. Career choices include urban design, transport planning, development assessment, plan preparation for housing and industrial areas, open space and recreational planning, environmental protection, and social and economic development.

Professional recognition

This course has accreditation from the Planning Institute of Australia.

What to expect

In your first year, you'll complete units that will lay the foundations for the remainder of your course. You'll explore the built environment, and receive an introduction to planning and design, urban development law, urban analysis and land-use planning. You will also develop your skills in negotiation and conflict resolution.

You will continue your studies in your second year, building skills in site planning, stakeholder engagement, transport planning and planning law, as well as engaging in units from your selected second major or set of minors.

From there, you'll have the opportunity to refine your understanding of urban design and property development and use your cumulative knowledge to undertake environmental planning activities. You will also reflect on your work placement and consolidate your research skills.

In your final year, you will explore advanced concepts of urban and regional planning, as well as planning theory and ethics. You'll look at real-world planning projects in studio and research environments, and potentially undertake an internship with a member of Queensland's Parliament. Your studies will culminate in a major research project with a faculty mentor, showcasing your acquired skills.

Urban development double degrees

Combine a degree in	with a degree in	Career opportunities
Construction management	Architecture	Combine architecture with construction to work as a valued architect and project manager in the building industry, using your skills in design, costing and supply management. You'll have advanced abilities in the design, development and coordination of the construction of large and complex projects.
	Interior architecture	Combine your creativity with project management skills to design, plan and manage the construction, renovation or enhancement of internal spaces. You could work as a consultant for small to medium enterprises, or with major architecture, design or building firms.
Urban and regional planning	Landscape architecture	Combine landscape architecture with urban and regional planning to enhance established neighbourhoods and shape new suburbs, cities and regions. You'll be able to design and manage the use of land and natural resources to meet human needs in a sustainable way, and work on large-scale projects such as new cities, suburbs, ports, recreational and industrial areas and transport infrastructure.
	Environmental science	Combine your keen interest in environmental science with urban and regional planning to ensure the sustainable and efficient use of land and natural resources to balance and enhance environmental and societal needs.

Invaluable experiences

Throughout my studies, I've learnt from lecturers and guest speakers with vast experience and knowledge on a variety of topics including environmental, transport and community planning, and architecture. We've also been able to exhibit and present our work to industry. It has been a valuable platform for knowledge sharing and refining projects.

I have been involved in the QUT Planning Student Association and a student member for the Planning Institute of Australia throughout my studies. These opportunities have been great for networking and learning more about the unique experiences of other planning experts.

Libby Hogarth

Shape our cities

I am currently working at Lendlease as an assistant development manager. Interacting with Lendlease while I was in the Dean's Scholars Program enabled me to learn more about the business, the projects they work on and the opportunities available.

The best thing about the course I studied was the lecturers and tutors who cared about the content they were teaching and sought to make us the best city-shaping graduates we could be.

Francesca Bell

²The availability of evening classes is not guaranteed.
The selection rank is a good indication of the equivalent ATAR. For more detail about courses and entry requirements, see pages 52-56 or visit qut.edu.au/study

Research as a career and honours programs



Bachelor of Information Technology (Honours)
Campus Gardens Point | **Duration** 1 year full time, 2 years part time | **Entry** February and July



Bachelor of Science (Honours)
Campus Gardens Point | **Duration** 1 year full time, 2 years part time | **Entry** February and July



Bachelor of Mathematics (Honours)
Campus Gardens Point | **Duration** 1 year full time, 2 years part time | **Entry** February and July

Why choose honours?

If you have an enquiring mind, take your passion further and extend your studies with an honours research program in your chosen field.

An honours degree builds on your undergraduate degree studies, providing further depth of knowledge and analytical skills you can apply throughout your career. It offers opportunities to cultivate research and development skills. Through a combination of research and advanced coursework units, you can pursue specialised studies in particular areas of interest. You can work with cutting-edge technology and access specialist facilities, laboratories, hardware and software.

Honours is an ideal pathway for high-achieving graduates to enter the doctoral program (PhD), is highly sought after by employers in some industries, and provides a wide range of career opportunities including research, analytic or teaching positions.

An honours degree can be undertaken in most of the faculty's study areas. Consult your course coordinator in second or third year to assess what projects may be available within your areas of interest.

Our honours projects

From robotics to biomedical engineering, we are leading the way with research that will contribute significantly to the social, economic and environmental wellbeing of people across the globe. It's exciting, world-changing work happening with projects such as:

- benchmarking elite athletes using multilevel models
- catching travelling waves with the freezing methods
- designing technology to promote physical activity in families with young children
- how many species have been saved by national parks
- speech recognition using deep neural networks
- turning waste into value using biotechnology.

For more examples of research projects, visit qut.edu.au/science-engineering/research/study-with-us/student-topics

Entry requirements

To be eligible for an honours course, you must have a bachelor degree in information technology, mathematics or science (depending on the course) or its equivalent, completed within the last five years, with a minimum grade point average of 5.0 (on QUT's 7-point scale).

Course design

Through a combination of research and advanced coursework units, honours students pursue specialised studies in an area of mutual interest with a personal research mentor/supervisor. As an honours student, you will develop high-level skills in a specific discipline area and acquire research skills appropriate to your discipline. Research units will enable you to develop an understanding of the nature of approaches to solving real-world, current research problems. Coursework units provide the opportunity to develop much more advanced skills and knowledge compared with those in your undergraduate course.

Honours-level studies prepare you for higher-level graduate careers and for research at a PhD level.

Engineering and urban development honours

The Bachelor of Engineering (Honours) and the Bachelor of Urban Development (Honours) feature embedded honours-level content throughout the course and you will graduate with a bachelor honours degree. This advanced knowledge and skills will benefit your professional career or future research and study.

Alex Vosten

Mathematician. Lecturer. Seeker of answers.

In high school, I believed maths would be just endless numbers and symbols, but that's just the surface. Mathematics is a process of thought—and is applied to every practical problem.

In my research, I am studying the behaviour of cells to help medical research. This study is interesting to me as I am keen to make a positive contribution to the understanding of Alzheimer's. But loving the process of finding problems and solving them helps me every day; from being a better cook to beating the traffic. Mathematics is the backbone of every single industry—it's just hiding.

Your application

1. Find the course that suits you

We can help you figure out your future. Visit qut.edu.au/study to find out as much as possible about the courses you are interested in studying, access the Match My Skills quiz, or explore the START QUT program which allows you to study subjects at QUT while you are in high school.

2. Check the entry requirements

For admission to QUT you must have completed Australian Year 12 (or equivalent), or be aged 18 years or older and applying on the basis of previous study or work/life experience.

How selection is made

For most QUT courses you are selected on the basis of an ATAR or selection rank. Course thresholds on pages 54–56 indicate the lowest selection rank to which an offer was made inclusive of adjustment factors in the 15 January 2020 offer round.

Thresholds can change from year to year and should be used as a guide only.

For more information see the online course information at qut.edu.au/study

Additional entry requirements

Some courses have additional entry requirements such as a portfolio or audition, or completion of a suitability statement. See the online course information at qut.edu.au/study

Assumed knowledge

For most courses, QUT has an assumed knowledge scheme. This means that we don't use specific school subjects as entry criteria for our courses; however we assume you have this knowledge when you study with us. You may struggle with your studies if you don't have the assumed knowledge. Visit qut.edu.au/assumed-knowledge

Prerequisites

Some courses have prerequisite subjects that you must have studied in order to gain entry to the course. Visit qut.edu.au/prerequisites

Bridging programs

If you have not met a prerequisite or do not have the assumed knowledge we strongly recommend completing a bridging program through QUT or other recognised providers. Visit qut.edu.au/study/bridging-programs

English language proficiency

You must demonstrate that you can speak, write, read and comprehend academic English to a specific standard. If you have an Australian Year 12 qualification, you meet the English proficiency standards. If your first language is not English and you have not undertaken senior schooling, higher study or significant professional work experience in the English language as recognised by QUT, you must demonstrate your English language proficiency.

QUT offer guarantee

Our offer guarantee can give you peace of mind about your study choices. If you receive an ATAR or selection rank equal to or higher than the offer guarantee, you are guaranteed a place in the course regardless of the threshold. This means that when you know your ATAR or selection rank you can check your eligibility for a QUT course before receiving an offer. You still need to lodge a QTAC application by the closing date. Check the offer guarantee for each course on pages 54–56. A small number of courses do not participate in the offer guarantee.

3. Investigate the admission pathways

Your background

You may have different admission pathways depending on your background, such as Year 12, vocational education and training (VET), higher education study or work experience. Selection ranks can be assigned to each of your qualifications and experience. QUT will generally use the best of your ATAR/selection ranks for entry, however if you're a current Year 12 student, or have completed Year 12 within the past two years with no further study or employment, the minimum requirement for entry in 2021 is an ATAR, completed International Baccalaureate (IB) Diploma or Queensland Certificate of Education (or equivalent).

Overseas qualifications

QUT will consider equivalent recognised overseas qualifications for admission purposes. If you have secondary or tertiary qualifications from countries where English (as recognised by QUT) is not the standard language of instruction, you must provide evidence of English language proficiency. For more information visit qtac.edu.au

4. Consider selection rank adjustments

You may be eligible for selection rank adjustments, making you more competitive for a course offer. The maximum possible adjustment is 10 selection ranks across all schemes. Adjustments may not apply to all courses. Visit qut.edu.au/apply/adjustment-schemes

Equity adjustment—educational disadvantage

If you have been disadvantaged in your education, you can apply for the Educational Access Scheme (EAS). If you are eligible for the financial hardship category and enrol to study at QUT, you will also receive a guaranteed \$3500 QUT Equity Scholarship. Apply for the EAS on your QTAC application.

Elite athlete adjustment

If you are an elite athlete, we encourage you to apply for the QUT elite athlete entry scheme via QTAC. You may receive an adjustment of up to six selection ranks. Current Year 12 students and non-Year 12 applicants may be eligible. Support with managing your studies and scholarships may also be available.

Subject adjustment—Year 12 subject scheme

QUT's Year 12 subject scheme offers adjustments for successfully passing certain school subjects or completing a university subject while at school (e.g. START QUT) for 2020 Year 12 students applying for entry in 2021.

Aboriginal and Torres Strait Islander people

The Oodgeroo Unit's Centralised Assessment Selection Program assists Aboriginal and Torres Strait Islander applicants with QUT entry by recognising life experiences, any study undertaken, skills, commitment and potential. If you identify via QTAC as an Indigenous Australian and list QUT in your top three preferences, the Oodgeroo Unit will contact you. Financial and study support is also available. Visit qut.edu.au/about/oodgeroo

5. Check the costs and apply for scholarships

Course fees

If you are a domestic undergraduate student you will study in a Commonwealth supported place (CSP). Your fees will be partly funded by the government and you also pay a contribution to the course cost. Your student contribution depends on the number of units you study and the band for each unit. You may be eligible for a HECS-HELP loan to defer payment of your fees. For more information check the course details at qut.edu.au/study

2020 student contribution bands for Commonwealth supported students

Band	Estimated cost (two semesters)
Band 1 Education, nursing, visual and performing arts, behavioural science, social studies, foreign languages	\$6684
Band 2 Computing, built environment, health, engineering, mathematics, statistics, science, surveying	\$9527
Band 3 Accounting, administration, economics, commerce, law	\$11 155

Scholarships

QUT is proud to offer a broad range of scholarships to recognise and support students. Visit qut.edu.au/scholarships

6. Make your application count

Applications for QUT undergraduate courses are made through the Queensland Tertiary Admissions Centre (QTAC) online application service. For advice about how to apply and ordering your QTAC preferences, visit qtac.edu.au

International students completing Year 12 studies in Australia must apply through QTAC. All other international applicants must apply directly to QUT or through one of our authorised agents or representatives. Visit qut.edu.au/international or phone (Australia Freecall) 1800 181 848.

Have a back-up plan

If you don't think you will receive the ATAR or selection rank for entry to your preferred course you can undertake further study to receive a new selection

rank. This is called upgrading. Your options include completing one year of degree-level study, or completing a diploma or advanced diploma.

You can also consider a TAFE QUT dual award, which provides automatic entry to the QUT bachelor degree after you've successfully completed your TAFE course. Dual awards are available in construction management, engineering, games and interactive environments, information technology and science.

Make sure you consider these options when completing your QTAC application. For details visit qut.edu.au/upgrading

7. Accept your offer

QTAC will notify you by email if you receive an offer. Once you have accepted your offer through QTAC, you can enrol at QUT via a link in your QTAC application. Visit qut.edu.au/apply/what-happens-next

Advanced standing

You can apply for advanced standing (credit) after you have received your QTAC offer. Students who have completed an IB Diploma may receive advanced standing for some units. Visit qut.edu.au/credit

Deferment

If you are a domestic applicant you can defer the start of your study for one year, except in some courses with admission requirements such as portfolio, audition, prior study or work experience, or where course changes do not permit deferment. In many circumstances, QUT may grant a further deferment of up to 12 months. For courses that are offered in both February and July, you can also request deferment of six or 18 months. Visit qut.edu.au/deferment

Confident start

I really enjoyed START QUT and it reinforced that QUT was 100 per cent for me. I loved the atmosphere and meeting people who shared my passions. When starting uni, I was more prepared and confident with a good understanding of what was expected for assessment and what the lectures and tutorials looked like. It gave me a great head start and I felt like I belonged.

Zoie Mearns
START QUT

Science and engineering at a glance

Course	Campus	QTAC code	Duration (years)	Assumed knowledge	2020 selection rank (including adjustments)	Offer guarantee	Deferment	Entry
Single degrees								
Engineering (Honours) with majors in Chemical Process, Civil, Computer and Software Systems, Electrical, Electrical and Aerospace, Mechanical, Mechatronics, Medical	GP	412502	4F	English, Math Methods	75.00	93.00	Yes	February July
Games and Interactive Environments with majors in Animation, Game Design, Software Technologies	GP	418102	3F	English, Maths	70.00	87.00	Yes	February
Information Technology with majors in Computer Science, Information Systems	GP	418801	3F 6P	English, Maths	70.00	87.00	Yes	February July
Mathematics with majors in Applied and Computational Mathematics, Operations Research, Statistics	GP	418701	3F 6P	English, Math Methods	89.00	93.00	Yes	February
Science with majors in Biological Sciences, Chemistry, Earth Science, Environmental Science, Physics	GP	418011	3F 6P	English, Math Methods	70.00	87.00	Yes	February July
Urban Development (Honours) (Construction Management)	GP	412312	4F 8P	English, Maths	70.00	93.00	Yes	February July
Urban Development (Honours) (Quantity Surveying and Cost Engineering)	GP	412312	4F 8P	English, Maths	70.00	93.00	Yes	February July
Urban Development (Honours) (Urban and Regional Planning)	GP	412352	4F 8P	English	70.00	93.00	Yes	February July
Engineering double degrees								
Engineering (Honours)	Business	GP	419532	5F	English, Math Methods	79.00	93.00	Yes February July
	Design (Architecture)	GP	419042	5.5F	English, Math Methods	82.00	93.00	Yes February July
	Design (Industrial Design)	GP	419032	5F	English, Math Methods	75.00	93.00	Yes February July
	Design (Interaction Design)	GP KG	409552	5F	English, Math Methods	75.00	93.00	Yes February July
	Design (Landscape Architecture)	GP	419102	5F	English, Math Methods	75.00	93.00	Yes February July
	Information Technology	GP	419512	5F	English, Math Methods	75.00	93.00	Yes February July
	Mathematics	GP	419572	5F	English, Math Methods	89.00	93.00	Yes February
	Science	GP	419402	5F	English, Math Methods	75.00	93.00	Yes February July

Course		Campus	QTAC code	Duration (years)	Assumed knowledge	2020 selection rank (including adjustments)	Offer guarantee	Deferment	Entry
Information technology double degrees									
Games and Interactive Environments	Business	GP	419692	4F	English, Maths	79.00	93.00	Yes	February July
	Mathematics	GP	418672	4F	English, Math Methods	89.00	93.00	Yes	February
	Science	GP	419682	4F	English, Math Methods	70.00	87.00	Yes	February
Information Technology	Business	GP	419202	4F	English, Maths	79.00	93.00	Yes	February July
	Communication (Digital Media)	KG GP	409142	4F	English, Maths	70.00	93.00	Yes	February July
	Creative Industries	KG GP	409872	4F	English, Maths	70.00	87.00	Yes	February July
	Design (Interaction Design)	KG GP	409452	4F	English, Maths	70.00	93.00	Yes	February July
	B Education (Secondary)	KG GP	409152	4.5F 9P	Prerequisites: English, Maths. Teaching suitability statement.	70.00	87.00	Yes	February July
	Engineering (Honours)	GP	419512	5F	English, Math Methods	75.00	93.00	Yes	February July
	Laws (Honours)	GP	419622	5.5F	English, Maths	87.00	93.00	Yes	February July
	Mathematics	GP	418552	4F	English, Math Methods	89.00	93.00	Yes	February
	Science	GP	418322	4F 8P	English, Math Methods	70.00	87.00	Yes	February July
Mathematics double degrees									
Mathematics	Biomedical Science	GP	419112	4F	English, Math Methods, Biology, Chemistry	89.00	93.00	Yes	February
	Business	GP	419212	4F	English, Math Methods	89.00	93.00	Yes	February
	Engineering (Honours)	GP	419572	5F	English, Math Methods	89.00	93.00	Yes	February
	Games and Interactive Environments	GP	418672	4F	English, Math Methods	89.00	93.00	Yes	February
	Information Technology	GP	418552	4F	English, Math Methods	89.00	93.00	Yes	February
	Science	GP	418712	4F	English, Math Methods	89.00	93.00	Yes	February
Science double degrees									
Science	Business	GP	419832	4F	English, Math Methods	79.00	93.00	Yes	February July
	Communication (Journalism)	KG GP	409462	4F	English, Math Methods	79.00	93.00	Yes	February July
	Communication (Professional Communication)	KG GP	409412	4F	English, Math Methods	70.00	87.00	Yes	February July
	Design (Landscape Architecture)	GP	419072	4F	English, Math Methods	70.00	87.00	Yes	February July
	Engineering (Honours)	GP	419402	5F	English, Math Methods	75.00	93.00	Yes	February July
	Games and Interactive Environments	GP	419682	4F	English, Math Methods	70.00	87.00	Yes	February
	Information Technology	GP	418322	4F 8P	English, Math Methods	70.00	87.00	Yes	February July
	Laws (Honours)	GP	419712	5.5F	English, Math Methods	87.00	93.00	Yes	February July
	Mathematics	GP	418712	4F	English, Math Methods	89.00	93.00	Yes	February
	Urban Development (Honours) (Urban and Regional Planning)	GP	412852	5F	English, Maths	New	93.00	Yes	February July

Course		Campus	QTAC code	Duration (years)	Assumed knowledge	2020 selection rank (including adjustments)	Offer guarantee	Deferral	Entry
Urban development double degrees									
Urban Development (Honours) (Construction Management)	Design (Architecture)	GP	419082	5F	English, Maths	82.00	93.00	Yes	February July
	Design (Interior Architecture)	GP	419312	5F	English, Maths	70.00	93.00	Yes	February July
Urban Development (Honours) (Urban and Regional Planning)	Design (Landscape Architecture)	GP	419782	5F	English	70.00	93.00	Yes	February July
	Environmental Science	GP	412852	5F	English, Maths	New	93.00	Yes	February July

QUT continually updates its courses to ensure relevance to the real world and to maximise choice and flexibility for students. For the latest, in-depth course information visit qut.edu.au/study

Footnotes

F = full time
P = part time

GP = Gardens Point
KG = Kelvin Grove

▫ The availability of evening classes is not guaranteed.

◆ For information about Bachelor of Education subject prerequisites and additional entry requirements see the online course information.

For assumed knowledge/prerequisite subjects:

- a grade of C or higher in Units 3 & 4 is specified
- English = one of English, Literature, English and Literature Extension, English as an Additional Language
- Maths = one of General Maths, Math Methods, Specialist Maths
- Science = one of Agricultural Science, Biology, Chemistry, Earth and Environmental Science, Marine Science, Physics, Psychology.

For interstate, TAFE or bridging course equivalent assumed knowledge subjects visit qut.edu.au/assumed-knowledge

The selection rank shown is the lowest to receive an offer in the 15 January 2020 offer round inclusive of adjustment factors. The selection rank is a good indication of the equivalent ATAR.

The 2020 selection rank should be taken as a general indication only. Courses may be harder or easier to get into from year to year, depending on demand for the available places.

Information contained in this publication was correct at time of printing. The university reserves the right to amend any information, and to cancel, change or relocate any course.

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This publication has been prepared for Australian students and those with permanent resident status. Some courses are not open to international students. To check the courses that are available for international student entry, or for more information about QUT, visit qut.edu.au/international

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