Science and Engineering
2018 undergraduate courses

Engineering
Civil | Computer and software systems
Electrical | Electrical and aerospace
Mechanical | Mechatronics | Medical | Process

Information technology
Computer science | Information systems
Games and interactive environments

Mathematics
Applied and computational mathematics
Decision science | Statistical science

Science
Biological | Chemistry | Earth
Environmental | Physics

Urban development
Construction management | Property economics
Quantity surveying and cost engineering
Urban and regional planning

a university for the real world
Every year many people make QUT their first choice for study.

Here’s why you might like to make it yours.

**Be in demand**  
QUT graduates are in demand. We continue to outperform Queensland and Australian average rates for graduate employment. During your time at QUT you’ll gain the knowledge, skills and connections to thrive in your chosen field.

**Global outlook**  
With QUT’s world-class courses and learning facilities, and programs for overseas exchange and engagement, you will be prepared to work in Australia and internationally.

**Convenient campuses**  
QUT has campuses at Gardens Point and Kelvin Grove in central Brisbane, and Caboolture in the growth corridor north of the city. With high-quality academic, recreational and support facilities, you will find QUT the perfect place to study.

**Research with impact**  
QUT researchers are working on some of the biggest challenges and opportunities facing Australia and the global community, and their research is recognised as world standard. If you have a passion for discovery and innovation, a QUT research degree can launch you into many exciting careers.

**Learn from the best**  
You’ll be taught by award-winning teaching staff and have access to industry-standard facilities and opportunities for practical, real-world learning, ensuring you’re ready to meet the demands of your industry or profession.

**The time of your life**  
You will study in a culturally diverse and inclusive environment, with support, development opportunities and social activities to help you discover your place in the world and make the most of your time at QUT.

**Real-world courses**  
As one of Australia’s leading universities, we offer a broad range of undergraduate degrees that can lead to a successful career. Prepare for employment in a changing world with up-to-date courses and flexible options to tailor your degree to your interests.
Dr Abigail Allwood
Science graduate and co-leader for NASA's Mars 2020 rover mission

When I was very young I knew I wanted to explore planets—the idea of exploring places that no one has ever gone to before really captured my imagination. However I didn’t know how to pursue a career in that area, and assumed I would have to study astrophysics to follow my NASA dream. I started a science degree at QUT with the idea of studying physics, but an elective in geology ignited my passion and was the beginning of my research journey to NASA.

Science is fabulous. It’s liberating that you can understand the world around you, and if you don’t understand you can use the scientific approach to figure it out yourself. So rather than having to accept something that others say about how the world works, as a scientist you can decide and form your own opinions, and pretty much tackle any problem.
Why choose STEM at QUT?

We want to change the world to make it a better place. And we know you do, too. Our tools for enacting this change are education and research in the areas of science, technology, engineering, mathematics (STEM) and urban development.

Our future demands STEM

Science, technology, engineering, mathematics and urban development are the engines of growth that underpin modern society and have wide-reaching impact on our everyday lives.

Our courses are designed to ensure that you graduate future-focused. We 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.

You’ll have access to technology and facilities that support your studies, including high-tech teaching spaces, high-performance computing and visualisation facilities, and advanced scientific instruments.

Relevant connections

QUT has longstanding relationships with leading industry partners such as Brisbane Airport Corporation, Boeing, Shell and SAP.

These connections offer you outstanding exposure to mentoring and real-world experiences including overseas internships, work experience placements and site visits. Students can also study at more than 100 international partner institutions.

In the workplace

Work integrated learning (WIL) at QUT gives you the opportunity to combine workplace activities with academic study, assessment and support.

WIL provides you with opportunities to:

- network and form working relationships with practitioners, consultants and suppliers within the industry
- see what is required on a day-to-day basis in your prospective career
- experience a project from beginning to completion
- expand your business, personal and academic skills
- be more competitive when you graduate.

Flexibility

Whether you dream of building skyscrapers or combating climate change, we have a degree for you. With over 50 courses across eight study areas, you have a range of choice.

A key feature of all our courses is the flexibility to tailor your degree to your interests and career aspirations.

We encourage you to shape your degree through complementary study areas. Choose a second major and develop a depth of knowledge and skills in two disciplines. Or you can gain further insight and depth in your primary study area by undertaking specialised minors. These options are explored further in the subsequent course pages.

Want to combine engineering and business? Sure, we have a double degree for that. What about science and law? No problem. With a double degree, you can combine relevant and interesting combinations of study to make yourself very employable.

Study support

We know the leap from high school to university can be a challenge. And so can returning to university study after a break. That’s why we offer study assistance programs such as STIMulate. STIMulate is there for all QUT students and helps build skills in maths, science and IT. The peer support program won the Australian Outstanding Peer Educator category of the Australasian Peer Leader Awards in 2015.
We also offer bridging programs in Chemistry, Mathematics B and Physics to prepare you for university studies where the subject knowledge is assumed. Bridging programs may be useful to brush up on your knowledge in a specific subject if it’s been a while since you’ve studied. See pages 51–52 for advice about assumed knowledge and bridging courses for each course.

Student clubs and projects
We know that coming to university isn’t just about studying, it’s about getting involved and experiencing new things. You can join a range of student-led projects and clubs. QUT Motorsport, Robotics Club, Engineers Without Borders, Women in Technology, LabRats, Natural Resource Society and Next Generation Property are just some of the groups where you can make leadership and team member contributions, and work with your peers to really make a difference. For more information about student clubs visit www.qut.edu.au/science-engineering/student-experience

QUT’s Science and Engineering Faculty: quick facts

- More than 2000 international students
- Students from more than 100 countries
- More than 80 industry partners worldwide
- Around 10000 students
- 6 schools and 21 discipline areas
- One of the Top 10 universities in Australia for PhD completion
- Close to 100 professors and 50 associate professors
- More than 400 researchers working towards new discoveries
- More than 100 partner institutions in more than 30 countries

75% of the fastest growing occupations require STEM skills and knowledge
Science and engineering on campus

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

Gardens Point campus
With more than 27,000 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:
• computing and science laboratories
• cafés and food court
• indoor FINA-standard, 50-metre swimming pool and a gym
• bookshop and retail outlets
• Oodgeroo Unit
• licensed bar
• Gardens Theatre
• QUT Art Museum
• Old Government House including William Robinson Gallery
• automatic teller machines (ATMs)
• travel agency
• QUT medical centre and counselling
• childcare centre.

Our Gardens Point and Kelvin Grove campuses are linked by free shuttle buses. Visit www.qut.edu.au/campuses-and-facilities

Great facilities
The science and engineering labs and workshops house the latest high-tech equipment and computer software to provide students with the ultimate hands-on learning experience.

Our state-of-the-art laboratories, workshops and research facilities are designed to mirror the real-world environments that students will encounter.

As part of the support for student projects and research, there is an extensive range of electronics parts, kits and equipment available free or for loan. QUT’s undergraduate students have a 24/7 electrical lab available, a workshop, and access to training in PCB design, soldering, 3D printing, laser cutting and more.

In the geoscience analytical laboratory you will analyse a wide variety of earth materials including rocks, sediments, soil and water.

Investigate and understand the organisation and function of genes and how evolution drives their change in the molecular genetics research laboratory. You will explore the molecular diversity of microbes, plants and animals at the single DNA fragment level right through to the whole organism genome level.

Prepare and purify organic and inorganic molecules in the preparative synthesis laboratory. These materials will have potential applications in medicinal, materials and supramolecular chemistry, as well as crystal engineering.

The S block electrical laboratories provide technologies and specialist learning aids for practical learning focused in the areas of industrial motor design, industrial control systems, electrical power network design and simulation, robotics systems, avionics systems, hardware and firmware design, and programming. You can also develop on single-board computers such as the popular Raspberry Pi and Arduino platforms.

The O block engineering precinct offers flexible laboratory spaces and cross-disciplinary activities. You may be part of engine development and biofuels testing, geomaterials testing, experimental equipment analysis, mechanical experimentation, spatial sciences, additive manufacturing, rapid prototyping, medical engineering, tissue culture, medical robotics, experimental materials or research.
Science and Engineering Centre

Our Gardens Point campus features a $230 million Science and Engineering Centre, with one of the world’s largest digital interactive learning and display spaces, The Cube. The Cube is the focal point of this accessible learning and community hub, encouraging an innovative and real-world approach to learning for all ages.

Home to the QUT Institute for Future Environments, with researchers developing ways to make our natural, built and virtual environments more sustainable, secure and resilient, the centre is a vehicle for collaborative and interdisciplinary discovery.

This state-of-the-art teaching and learning environment, unmatched anywhere in Australia, will inspire you to reach your potential and exceed your goals.

The centre is open to students, the community, schools and teachers. For details of events and engagement opportunities visit www.thecube.qut.edu.au
Scholarships and leadership development

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

Vice-Chancellor’s Scholarships
QUT’s Vice-Chancellor’s Scholarships are awarded to domestic and international students with outstanding achievement. Scholarships range in value from $10,000 to $30,000 and are available for academic, sporting or creative excellence.

Students must be completing senior studies in Australia in 2017 or have completed Year 12 in 2016 and be starting university for the first time in 2018.

Scholarship applications close on 17 November 2017.

Dean’s Scholars Program
Our Dean’s Scholars Program is a focused leadership program for outstanding students undertaking any single or double degree in the Science and Engineering Faculty. Dean’s Scholars are an elite group of students who have demonstrated high academic achievement and aspire to be future leaders.

As a Dean’s Scholar, you can expect to more fully develop and utilise your leadership skills in STEM-linked careers through industry experience, international exchange programs, professional development and mentoring. Industry sponsors of the program include Bechtel, Boeing, Energex and Lend Lease.

Entry requirements
Students who are awarded a Vice-Chancellor’s Scholarship (Academic) and achieve a grade point average (GPA) of 6.0 or above in their first semester will be invited to apply for a place in the Dean’s Scholars Program from Semester 2.

To find out more about the Dean’s Scholars Program visit www.qut.edu.au/science-engineering/deans-scholars-program

Westpac Bicentennial Foundation Young Technologists Scholarship
The Westpac Bicentennial Foundation Young Technologists Scholarship is designed to strengthen Australia’s pool of local talent and build a cohort of technology-literate future leaders. Awarded on merit, applications close in November each year.

Indigenous scholarships and support
Aboriginal or 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.

Women in Engineering Scholarship
The Women in Engineering Scholarship encourages and supports female students entering their first year of full-time engineering study.

Recipients of a Women in Engineering Scholarship are eligible for the Monique Cramer Award. Applications close in November each year.

Women in Information Technology Merit Scholarship
Up to six scholarships are available to Queensland Year 12 female domestic students with an OP 1-5 who want to enrol full-time in an undergraduate information technology degree. The scholarship is paid over the first two semesters of study. Applications close November each year.

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.

Sponsors of the Dean’s Scholars Program

[Images of sponsors]
Rob Lucas

Receiving the Vice-Chancellor’s Scholarship for academic achievement has been more rewarding than just money. The chance to join the College of Excellence and the Science and Engineering Dean’s Scholars Program, and to meet like-minded friends, has been amazing. The group is so varied and diverse; I always feel like I have a friend in every course and club.

Becoming involved in course-related social clubs is essential for making the most of your time at uni and has helped me make friends through shared passions and activities. Many clubs also provide networking opportunities with academics and industry, which develop my interpersonal skills and give me the chance to talk to people who provide invaluable advice.

Ezekiel Nimpaye

Ezekiel Nimpaye spent a significant part of his childhood in a refugee camp following the outbreak of civil war in his homeland of Burundi, Africa. Separated from family members, Ezekiel fled his hometown and was reunited one of his brothers on the road to the Tanzania, where he lived for several years in a camp before being granted refugee status and relocating to Australia.

Entering the Australian school system in Year 10 with limited English language skills, Ezekiel pursued his dream of studying engineering at university. Gaining entry to engineering was a huge achievement and he also applied to receive support from QUT’s Learning Potential Fund. The scholarship helped Ezekiel to focus on his studies. He graduated in December 2016 and soon after travelled to his home village in Burundi to visit his family, before starting his career with a graduate engineering role.
International experience

Our international study and internship opportunities are valuable experiences that prepare you to work globally.

We actively encourage and support you to undertake an international study 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 all qualities that 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 built links with a wide range of international institutions in 32 countries around the world. 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).

With many of these institutions renowned for their excellence in science, engineering, mathematics and technology, our exchange program offers a great opportunity to expand your horizons both personally and academically. And language is not the barrier it once was, with the range and number of units taught in English at our partner institutions increasing each year.

Internships

Internships offer the best of both worlds. Gaining international experience while developing your practical skills through an industry- or lab-based internship will strengthen your qualifications. It’s another avenue for QUT students to gain highly valuable experience.

We have exciting opportunities available specifically for students in our Science and Engineering Faculty. Our students have undertaken internships with BMW, Fraunhofer, Hochtief and other industry leaders, in locations around the world such as Germany, France, Japan, Turkey, Canada, Hong Kong and the United Kingdom.

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 www.qut.edu.au/study/overseas-study-and-exchange

Danielle Vaz

My semester studying at the University of Westminster in London was one of the highlights of my entire university experience, and being awarded a QUT exchange bursary was an added bonus. I lived in the absolute heart of London, studying in a beautiful campus on Regent Street and was able to make lifelong friends from all around the globe.
Real-world research

If you want to make a difference in the world, consider extending your studies into research.

Research-based learning
Our researchers work in key 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.

It’s this research that informs and enhances all aspects of teaching. Through research-based learning you will develop the critical thinking and entrepreneurial skills that are essential in graduate-level positions.

Throughout your studies you will have the opportunity to explore research themes and projects. If you have an enquiring mind and enjoy these opportunities, you can take your passion further and extend your undergraduate degree with an honours program. For more information about honours, please refer to page 49.

Learn alongside researchers
QUT offers a rich research environment giving you the opportunity to connect with leading researchers at hospital-based facilities, environmental living laboratories, aerospace centres and QUT-based institutes. Students benefit from direct exposure to leading research teams that are tackling innovative solutions to a huge range of real-world challenges impacting on the future safety, health, security and wellbeing of Australians.

Our Vacation Research Experience Scheme is the opportunity to delve into the world of research by working with active researchers on a real project for a period of six to 10 weeks. It offers a challenging environment and is ideal if you’re keen to investigate your potential for a career in research.

For more information about the Vacation Research Experience Scheme, please visit www.qut.edu.au/undergraduate-research-experience

Brendan Langfield
Brendan was motivated to study physics by the books of scientists like Carl Sagan and Neil Degrasse Tyson. Through QUT’s Vacation Research Experience Scheme, he worked on a project investigating 3D printing of human tissue and has continued to work with the project team as a research assistant.

There are a lot of different ways to solve a problem. Physics involves and invokes an awful lot of creativity in how you get to a solution. I find that to be really exciting and rewarding.
To engineer a better world, you need to understand real-world applications. A QUT engineering degree offers you a winning combination of theory and practical learning, giving you the power to really make a difference.

As an engineer, anything is possible. Engineers make things happen by developing practical solutions which impact on the real world with major significance to society. Your QUT engineering degree will give you the practical expertise to shape a more positive future.

**Experience a real difference**
Your QUT degree is all about real-world application. Industry connections, student-led projects, international study tours and access to multimillion dollar research facilities add up to a rich and challenging learning experience.

**Learn from the experts**
Our teachers are leaders in their field, respected by and connected to industry. It is this real-world experience that makes the difference.

**Bonus scheme**
QUT’s entry bonus scheme awards two bonus QTAC ranks for students who successfully complete Engineering Technology, Maths C, Physics or a language in secondary school. For more information visit [www.qut.edu.au/entry-bonus](http://www.qut.edu.au/entry-bonus)

**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. Engineering at QUT is widely recognised internationally, giving QUT graduates more career opportunities overseas. We also have close links with local and overseas industries.

**The honours edge**
Both the single and double degrees in engineering include honours-level content integrated throughout the course. A bachelor honours degree is a higher-level qualification than a bachelor degree. The advanced knowledge and skills will benefit you in your professional career, or future research and study.

Your engineering degree
In your first semester, you will become familiar with the foundations of engineering mathematics, engineering materials and design, and the basic principles of sustainability. Completing these units will enable you to make an informed decision when choosing your major. If you already know the type of engineering you want to study, you can choose units from that major in second semester. If you are still unsure, you can continue to explore the engineering pathways in your second semester, and then decide on your major at the end of your first year.

Choose your major
Once you’ve completed your foundation units you will choose your career direction—selecting your major from eight in-demand areas within the engineering sector. These majors are your main study area and fall within three broad engineering fields of mechanical, civil and electrical. Your major units allow you to tailor your course to suit your own career aspirations, pursue a project of special significance to your profession and meet the requirements of professional accreditation.

Core units
**Engineering sustainability and professional practice** introduces the concept of sustainability and how it impacts current and future engineering ventures. You’ll develop professional skills essential to your engineering career.

**Foundations of engineering design**
develops the fundamental knowledge and skills to design, build and test simple engineering systems through a number of exploratory, hands-on activities including a mini-project.

**Energy in engineering systems** introduces the concepts of energy in the context of real engineering systems and the interrelationships between forces, motion and energy.

Mathematics unit options
At QUT, mathematics for engineering continues on from where Maths B finishes at school. If you have obtained a sound achievement (or higher) in Maths B or equivalent, you will enrol in the unit Introductory Engineering Mathematics. This unit will introduce you to the foundational mathematical concepts of functions, matrix and vector algebra, together with the operations of differentiation and integration. You will then study Engineering Computation and develop key skills in mathematics, statistics, modelling and programming that will equip you with a set of fundamental tools for problem solving in the engineering context.

If you have studied additional mathematics, including Maths C or equivalent, we recommend that you undertake a mathematics self-evaluation to help identify the most appropriate mathematics unit for you to study in first semester. Based on the evaluation, you will choose to stay with Introductory Engineering Mathematics or consider enrolling in an alternative unit called Computational Explorations.

Your Bachelor of Engineering (Honours) degree
Your 32-unit engineering degree is made up of three distinct parts:

<table>
<thead>
<tr>
<th>Engineering core units</th>
<th>8 units</th>
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<tr>
<td>Primary major</td>
<td>Choose one of eight majors, undertake a capstone project and develop research skills</td>
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<tr>
<td>Complementary study</td>
<td>Second major or two minors</td>
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Flexible study options

A QUT engineering degree offers you diversity and options to pursue areas of study which match your career and personal interests.

As well as choosing a major area of study, your degree also includes a second study option, which may be a second major, or a double minor option where you study two sets of four units. This may consist of projects and specialisation units, or your own selection of four pre-approved, university-wide units to round out your skills and broaden your career options. You will be supported in tailoring your study plan to meet your career aspirations.

Second study area options
Second study areas are constantly being developed and the options outlined are an example of the range of programs which may be available.

Second majors (eight units)
Choose a second area of study and develop a significant depth of knowledge in two discipline areas. You could pursue another engineering discipline or explore different perspectives which may include aerospace, computer and software systems, construction, electrical, environmental, mechanical, medical, structural, or transport engineering; applied economics and finance; computational and simulation science; or logistics management.

See ‘Expand your expertise’ on pages 12–19 for the second majors you can take with your chosen engineering major.

Minor (four units)
You might prefer to expand the breadth and depth of your studies by adding two minors to your chosen engineering major. Minors may include:

- **Computational and simulation science** uses computer simulation to model complex real-world phenomena, combining aspects of science, mathematics and computing.
- **Engineering construction** introduces the processes of bidding and managing civil engineering construction projects.
- **Engineering structures** is the mechanics, analysis and design of civil engineering structures.
- **Environmental management** is about incorporating integrated solutions with multiple benefits across environmental, social and financial performance within your core discipline.
- **Science and mathematics education** opens alternative career pathways by upskilling you with strong communication and education skills. This minor is unique to QUT and will enhance your own learning through teaching others and effectively communicating complex concepts in a variety of formats.
- **Materials** gives you the knowledge and skills to understand the basics of materials and their failure.
- **Physics for engineers** covers the core theoretical knowledge of physical phenomena from a different and complementary perspective to that which would normally be experienced by an engineering student.
- **Robotics** develops an understanding of robotics and requirements for intelligent behaviour of a robot.
- **Thermofluids** provides an understanding of thermodynamics and fluid mechanics concepts and the use of these concepts in the analysis and understanding of mechanical systems.
- **Motor racing vehicle design** develops the knowledge and skills in areas related to motor vehicles including tribology, design, manufacturing and operations management.

For the full list of Bachelor of Engineering minors visit [www.qut.edu.au/study/study-areas/engineering-courses](http://www.qut.edu.au/study/study-areas/engineering-courses)

Diversify your study (four units)
Broaden your studies to include minors that offer general knowledge and insights into specific areas. You might also choose to learn a language, or experience the real world through study overseas and gain credit through an international exchange minor.

Amy Gunnell

I chose to study mechatronics as it focused on the design and control of both mechanical and electrical systems and the interactions between the two. It provides a complete look at an engineering system—not just the mechanical or the electrical aspects. I was able to gain further insight and depth in my degree by choosing the robotics second study area.

Since completing my degree I have been working as an automation engineer at a food manufacturing company in Australia and work with a variety of control systems from individual robot control to whole manufacturing lines.
Genevieve De Michele

Genevieve enjoyed the applied nature of the civil and construction coursework and found that many of the theories, concepts and practical exercises she studied were directly applicable to her employment in engineering.

While at university I was offered employment as an undergraduate civil design engineer and an undergraduate fly-in fly-out site engineer. I was working in two very different fields but QUT really prepared me for the challenges of each role.
Bachelor of Engineering (Honours)  
(Computer and Software Systems)

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. The discipline combines principles of computer science with the rigour and problem-solving skills of engineering. If you are interested in computer programming, technical design and solving complex problems, then software engineering could be for you.

Why choose this major?
This course will provide you with a background in electrical engineering with an embedded systems specialisation, along with software design and implementation skills. You will learn about the central role of software in the modern world—in banking and finance, government, education, transportation, entertainment, science, medicine and law.

You will also learn about the many applications of software that are safety critical or involve large and expensive systems that have major impact on people's lives, livelihoods and the economy. The effectiveness of these applications depends on the skills of software engineers.

Career outcomes
There is a wide variety of industries that employ software engineers. Software engineers can work in engineering, for example specialising in transport in rail, vehicle, traffic management or construction. They may also work in information technology-specific industries in software architecture, cyber-security or as an embedded software engineer. Other industries that need software engineers include education, healthcare, banking and finance, as well as organisations such as Microsoft, Google and Amazon.

Expand your expertise
Choose a second major or two minors to meet your career aspirations. Complementary second study areas for this major may include:

• aerospace engineering
• mechanical engineering
• transport engineering
• applied economics and finance
• computational and simulation science.

For a full list of options, visit the course page at www.qut.edu.au/study/study-areas/engineering-courses

Your course

YEAR 1

• common units in the first year
• fundamental concepts in engineering
• foundations of engineering mathematics
• basic principles of sustainability
• overview of engineering disciplines

YEAR 2

• software development
• fundamentals of electronics, electronics circuit design, telecommunications and networking protocols
• writing software to solve engineering problems
• computer programming skills

YEAR 3

• software engineering principles including formal software engineering processes and modern software engineering practices
• microprocessors and embedded digital systems
• application of systems engineering principles to a real-world project

YEAR 4

• a major project bringing together your knowledge of software engineering principles
• embedded systems and security
• additional electives can be chosen
• work integrated learning experience

Tim Peut

QUT encourages you to think big. It is never enough to just solve a problem; you are taught to go above and beyond. I completed an internship with Google at their global headquarters in California where I designed and developed test infrastructure for a large software system. I now work there full time and as you would expect, it’s amazing. Not bad for a first job! Knowing that your work can impact on millions of Google users around the globe leaves you with a great sense of accomplishment.
Electrical engineering deals with the design, research, development, planning, manufacture and management of electrical systems and devices which underpin modern economies and contribute to quality of life. Electrical engineers work with equipment ranging from heavy power generators to tiny computer chips. They work with senior administrators, civil and mechanical engineers, computer scientists and various stakeholders in the business, building and construction industries. If you are interested in working with your hands and technical equipment, an electrical engineering career could be for you.

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 be challenged by practical experiences through laboratories and design projects to make immediate contributions to industry.

Career outcomes
Studying electrical engineering can lead you to careers in the power industry, robotics, manufacturing, mining and bio-engineering. Opportunities are also found in the telecommunications industry, mining and transport sectors, as well as computer and transmission industries. You may find employment in service industries, large industrial groups and small innovative private firms.

Expand your expertise
Choose a second major or two minors to meet your career aspirations. Complementary second study areas for this major may include:
- aerospace engineering
- mechatronics engineering
- transport engineering
- robotics
- motor racing vehicle design.

For a full list of options, visit the course page at www.qut.edu.au/study/study-areas/engineering-courses

Samuel Eden
No matter what the situation, I have always loved problem solving. Engineers tackle problems every single day to improve all aspects of our lives, so engineering seemed like a perfect fit for me. I studied electrical engineering, and it gave me the skills to understand and solve problems that I couldn’t have imagined. I found the hands-on approach to projects and learning one of the most beneficial aspects of my degree. I put the theory into practice by building functional devices every single semester.
Aerospace avionics engineering involves design, development, manufacture and maintenance work on the electronic systems of military and civilian aeroplanes, helicopters, spacecraft, satellites and uninhabited aerial vehicles (UAVs). If you are interested in how things work, space and flight, technology, electronics and aircraft systems, an aerospace avionics career could be for you.

Why choose this major?
You will learn about aerodynamics, aircraft control systems, avionics navigation and communications, and specialise in the design of electronic systems for aircraft and satellite systems using systems engineering methodology.

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. Field trips provide you with a first-hand view of aerospace avionics, plus you will interact and engage with QUT engineers and researchers in the field.

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

Expand your expertise
Choose a second major or two minors to meet your career aspirations. Complementary second study areas for this major may include:
- computer and software systems engineering
- mechanical engineering
- transport engineering
- computational and simulation science
- robotics.

For a full list of options, visit the course page at www.qut.edu.au/study/study-areas/engineering-courses

Rhianna Ferguson
Ever since I was young, I have been inspired by space travel and interested in electronics so QUT’s tailored avionics course was the obvious choice. With a Boeing travel bursary I toured the United States for a month and visited Cape Canaveral where I was lucky enough to witness a space launch at NASA. I worked as a student engineer at Boeing Defence Australia as part of the Super Hornet avionics team. After graduating I gained a full-time position with Boeing and now I’m working on Wedgetail in Seattle. I absolutely love my job. Seeing the jets take off and knowing that I have contributed in some small way is an incredibly satisfying feeling.
Bachelor of Engineering (Honours) (Mechanical)

Mechanical engineering turns energy into power and motion. Mechanical engineers design, create, improve and maintain systems and machinery that are used for private and commercial purposes. They keep pace with technology and act as an interface between technology and society, playing an essential role contributing to the sustainable and future development of industry.

Why choose this major?
Mechanical engineering at QUT offers you a balanced mix of theory and practice to prepare you for the work environment.

You 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. In this way, QUT makes you fully prepared to work in every aspect of mechanical engineering from technical analysis to the operation and maintenance of equipment and systems.

Career outcomes
The diverse activities and skills of mechanical engineering means a wide range of exciting employment opportunities for graduates 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.

Responsibilities might include installing and commissioning a plant, or designing the mechanical features of the equipment. You may also work in a manufacturing plant and handle the logistics of production and the efficient management of people and systems.

Expand your expertise
Choose a second major or two minors to meet your career aspirations. Complementary second study areas for this major may include:

• environmental engineering
• medical engineering
• transport engineering
• motor racing vehicle design
• thermofluids.

For a full list of options, visit the course page at www.qut.edu.au/study/study-areas/engineering-courses

Olivia Hutchinson
Throughout school, maths and science were always my favourite subjects and I decided I wanted to follow a career in this path. I saw engineering as a way to apply the theory I enjoyed to create something that improves society. QUT teaches you how to apply the theory.

This mechanical engineering degree produces graduates who are prepared for industry and who are sought out for their real-world knowledge. QUT also provides amazing international opportunities and industry partnerships. We were able to intern with different engineering companies during our course and one of my internships led me to working for Boeing here in Brisbane.
Bachelor of Engineering (Honours) (Mechatronics)

2017 OP/rank 9/81
OTAC code 412502 | Campus Gardens Point | Duration 4 years full time | Assumed knowledge English (4 SA) and Maths B (4 SA) | OP Guarantee Yes | Entry February and July

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. Engineers who can manage the disciplines of mechanical, electrical and computer engineering simultaneously are becoming essential across all industrial sectors such as the manufacturing and process industries, primary production and mining, and the service and health industries. If you are interested in technical and engineering work, mechanical equipment such as robotics, physics and mathematics, a career in mechatronics could be for you.

Why choose this major?
Mechatronics engineering is the hybrid discipline of mechanical, electrical and electronic engineering, and computing. This degree provides you with skills in all these disciplines to enter the growing industry.

You will benefit from QUT’s close links with industry and may be involved in projects such as QUT Motorsport and the aerospace avionics Uninhabited Aerial Vehicle Outback Challenge.

Career outcomes
You may find employment 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 manufacturing industries, large-scale manufacturing and maintenance industries such as aerospace, instrumentation industries, communication companies, research organisations, food and food processing industries, and software development companies.

Expand your expertise
Choose a second major or two minors to meet your career aspirations. Complementary second study areas for this major may include:
- aerospace engineering
- mechanical engineering
- medical engineering
- physics for engineers
- robotics.

For a full list of options, visit the course page at www.qut.edu.au/study/study-areas/engineering-courses

Your course
YEAR 1
- common units in the first year
- fundamental concepts in engineering
- foundations of engineering mathematics
- basic principles of sustainability
- overview of engineering disciplines

YEAR 2
- engineering science knowledge in design, dynamics, fluid mechanics, manufacturing and mathematics fundamentals
- technical computing, computational fluid dynamics and engineering drawing
- practical experience in our laboratories

YEAR 3
- knowledge and skills in professional areas including design and thermodynamics
- specialist areas such as electronics, microprocessors and mechatronics, operations management and machines
- advanced communication skills

YEAR 4
- specialised areas such as mechatronic systems design, instrumentation and control, and computer intelligence
- an industry-based project that brings together your previously mastered skills
- work integrated learning experience

Tiffany-Jo Stansfield
I’m interested in the movement of objects and how they work together. I also find the idea of working with robots very intriguing. I chose QUT because you can work in the labs and use all of the high-tech equipment from the very first year. Receiving a place in the Dean’s Scholars Program also drew me to the university. It allowed me to meet other Dean’s Scholars and form close friendships. I gained so much confidence through learning new skills and meeting new people.
Medical engineers work with doctors and medical scientists to design, manufacture and maintain medical equipment to improve healthcare and medical services. The discipline applies engineering and scientific methods to find solutions to problems in medicine and the life sciences. Medical engineering integrates engineering principles with human physiology to design, manufacture, install, monitor and maintain medical and surgical equipment. Medical engineers are responsible for the safe and effective operation of equipment such as monitoring, diagnostic and therapeutic medical equipment ranging from CT scanners to kidney dialysis machines.

**Why choose this major?**

During this degree you will undertake professional experience and other hands-on activities such as hospital and industry site visits. There is also the possibility of involvement 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 may find employment in hospitals as advisers to health and medical professionals, in firms concerned with design, manufacture, supply and maintenance of medical, health and sporting equipment, in occupational health agencies, and in research institutions. Biomedical engineers may be involved in the design of new devices and the assessment of engineering solutions to medical problems. They may also manage biomedical engineering departments in hospitals and manufacturing companies, and lead teams of engineers and technologists.

**Expand your expertise**

Choose a second major or two minors to meet your career aspirations. Complementary second study areas for this major may include:

- computer and software systems engineering
- mechanical engineering
- mechatronics engineering
- materials
- robotics.

For a full list of options, visit the course page at [www.qut.edu.au/study/study-areas/engineering-courses](http://www.qut.edu.au/study/study-areas/engineering-courses)

**Jenna Lyon**

I had a strong interest in physics during high school but I wanted to study something that had a direct impact upon people. Medical engineering was a great combination of both of these interests. I chose QUT as it is the only university in Brisbane that offers a mechanics-based medical engineering degree.

I really enjoyed the design and build work that QUT integrates into its engineering course. In one of our classes we undertook a design challenge for the Rehabilitation Engineering Centre based at the Royal Brisbane and Women’s Hospital. I loved the opportunity to design something with a real-world application that could be used to help people living with disabilities.
Bachelor of Engineering (Honours) (Process Engineering)

A process engineer develops and optimises industrial processes to make the huge range of products on which modern society depends. Process engineering involves refining, renewing or modifying raw materials (for example, plants such as sugar cane, ore-bearing rocks, waste, commodity chemicals or animals) to produce useful products and by-products for our society. Process engineers are involved in designing equipment, controlling chemical reactions, developing process control strategies, and operating and upgrading industrial processes.

Why choose this major?
You will learn to apply practical analysis and technical principles to the areas across both science and engineering including mathematics, chemistry, energy systems, fluid mechanics, engineering materials, energy management and process management.

You will also develop project management and leadership skills to approach complex and multidisciplinary problems. You will have access to opportunities for site visits, work integrated learning and research projects.

Objective outcomes
Process engineers have many career options including consulting, contracting, general management, investment analysis and advice, process planning and design, operations management, research or technical specialist. You may gain employment across industries including professional, scientific, technical and environmental services, manufacturing, mining, and electricity, gas, water and waste services.

Expand your expertise
Choose a second major or two minors to meet your career aspirations. Complementary second study areas for this major may include:
- construction engineering
- electrical engineering
- environmental engineering
- materials
- thermofluids
- logistics management.

For a full list of options, visit the course page at www.qut.edu.au/study/study-areas/engineering-courses

Imogen Kerr
Chemistry and maths were my favourite subjects in high school and I was so excited to be able to explore these topics further with process engineering. I love that in my degree I learnt about the overall process of a wide variety of industries while having a strong focus on the economic and financial aspects of projects. QUT gave me the opportunity to learn from mega projects in Germany and I applied this learning to my work experience at an Australian oil and gas project on Curtis Island. I learnt that process engineering can take me anywhere in the world, and that the skills I gained at QUT have real-world, real-life and international possibilities.
Technology transforms the world. It changes the way we learn, communicate, work and enjoy life. QUT’s hands-on approach provides you with the skills and specialised knowledge to lead these changes and progress your career.

**Employability**
As the world goes digital, doors open to opportunities across a diverse range of industries including aviation, mining, engineering, finance, creative industries, networking and communications. Your QUT degree will position you to pursue a range of technical or consulting careers. Our new interactive learning spaces and real-world, hands-on approach will equip you with the skills to be in demand as a problem solver and innovator.

**Learn from the experts**
Our lecturers are experts in their field and include award-winning teachers and world-renowned researchers. All have strong connections with industry through professional experience, applied research and consultancy projects.

**Global links**
We maintain strong links with large vendors such as Microsoft, SAP, Fujitsu and PricewaterhouseCoopers, and IT users such as Suncorp and Bank of Queensland. Our network of corporate partners provides a valuable insight into information technology, as well as opportunities for internships here and overseas. Our links with key universities with strengths in information technology studies and research, throughout Europe, Asia and the Americas, provides opportunities to study IT on an international scale.

**Games and interactive environments**
Our Bachelor of Games and Interactive Environments is the most successful degree of its kind in Queensland, with strong connections to local games industries, as well as other industry partners in game-based technology. Focusing on both the technical and creative aspects of games development, you’ll also gain expertise through your choice of major in animation, game design or software technologies.

**Your information technology degree**
Technology is an ever-changing landscape. Our Bachelor of Information Technology degree enables you to meet the needs of the rapidly changing world. If you are not sure of your career direction, this degree allows you to sample a range of disciplines during your first year of study. From your very first semester, you will deepen your understanding of information technology and how to design and develop solutions. The second semester gives you an opportunity to sample the disciplines of computer science and information systems.

**Choose your major**
The computer science and information systems majors deal with the growing areas of design and development of new applications based on emerging technologies, and finding new and more effective ways of doing business within organisations. We equip our graduates with the technical, problem-solving and collaboration skills that industry is seeking. The majors provide the ability to transform organisations and society through information technology.

**Real experience**
In second and third year, you will complete a major in either computer science or information systems and gain further practical experience in our innovative learning spaces. In your final year you will design, develop and deliver a major product related to that discipline. You can select your product relevant to an industry partner or engage in a project with one of the faculty’s information technology research groups.

**Computer technology fundamentals**
focuses on the architecture of computers, networks and the web, and develops knowledge and understanding of how these components work and function now and into the future.

**Designing for IT** introduces design thinking, a much sought-after skill, as it provides an effective approach for innovation, problem solving and user-centred solutions. Put your design thinking into practice by pitching ideas and designs, and working with user and peer feedback.

**Build IT systems** provides hands-on experience with the various kinds of computer languages used to build information technology systems. The focus is more on how languages are used by information technology developers rather than on the details of programming.

**A core option unit** allows you to broaden your understanding of fundamental information technology concepts. Options include foundation units from the two information technology majors as well as units from games studies, science, mathematics and business.

**Your Bachelor of Information Technology degree**
Your 24-unit information technology degree is made up of three distinct parts:

- **IT core units**
  6 units

- **Primary major**
  Choose one of two majors
  10 units

- **Complementary study**
  Second major or two minors
  8 units

**Global links**
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**A core option unit** allows you to broaden your understanding of fundamental information technology concepts. Options include foundation units from the two information technology majors as well as units from games studies, science, mathematics and business.

**Your Bachelor of Information Technology degree**
Your 24-unit information technology degree is made up of three distinct parts:

- **IT core units**
  6 units

- **Primary major**
  Choose one of two majors
  10 units

- **Complementary study**
  Second major or two minors
  8 units
Flexible study options

Foster your passion and shape your future career through complementary study areas.

As well as choosing a major area of study, your degree also includes a second study option, which may be a second major, or a double minor option where you study two sets of four units.

Second study area options

Second major (eight units)
Choose a second area of study to complement your major, and develop a significant depth of knowledge and skills in two discipline areas. You could pursue another concentration in a second information technology discipline, or explore different perspectives which might include:

Innovation technology and design
provides you with the skills to design and develop innovative solutions to a range of IT problems, and transform the way businesses use technology.

Computation and simulation science
uses computer simulation to model complex real-world phenomena, combining aspects of science, mathematics and computing.

Minors (four units)
You might prefer to expand the breadth and depth of your studies by adding to your IT major with two minors. Minors include:

Data-centric computing
provides the knowledge and skills to engage in developing applications for data storage, manipulation, integration, visualisation, analytics and decision support.

Networks and security
develops knowledge and skills in creating contemporary electronic communications infrastructure, concentrating on fundamental networking technologies and information security principles.

Business process management (BPM)
introduces a wide range of methods and tools to conduct end-to-end process improvement projects within organisations. You will learn how to capture and model business processes, as well as how to use and adapt information technology to improve these processes.

Social technologies
are changing the way we work, learn, play and interact with each other. You will gain knowledge and expertise in implementing social media to solve problems and to engage people, and will be able to consistently use social technologies to facilitate social enterprise in the value chain, business support, and business ventures.

Other minor options include:
- computational and simulation science
- computer science
- enterprise systems
- user experience
- information systems
- intelligent systems
- mobile applications
- software development
- technology innovation.

For more information about the Bachelor of Information Technology minors visit www.qut.edu.au/study/courses/bachelor-of-information-technology

Diversify your study (four units)
Broaden your studies to include minors that offer general knowledge and insights into specific areas. You can choose from a range of university-wide minors, or you might choose to learn a language, or experience the real world through overseas study and gain credit through an international exchange minor.

Kelvin O’Shea

During his four-week internship with Tanda, Kelvin O’Shea redesigned the company’s time clock. Tanda is a software company founded by QUT alumni that offers products for tracking employee time and attendance for businesses.

The internship gave me an opportunity I would not have expected from a typical internship. To be given the responsibility to redesign a product core to the business was every bit challenging, exciting and motivating. It has helped me develop my technical skills and understand how this knowledge translates from university to the pace of the real world.
Computer science is the scientific and practical approach to computer-based system design, development and operation. It deals with areas ranging from the fundamental principles of computation, through to tools and techniques for IT system development and evaluation including identifying and solving systems design issues associated with efficiency, usability and security. Computer science applications extend into specialised areas including mobile computing, artificial intelligence, robotics and large-scale information management involving information retrieval and web search engines. If you want to work with cutting-edge technology and be a part of creating technologies that have not yet been invented, a computer science career could be for you.

Why choose this major?
This major focuses on what makes technology work. It deals with using hardware and software to design and build systems to solve complex problems. You will learn programming and software design techniques, networking technologies and the architecture of different types of hardware systems. Our degree structure is flexible, giving you the opportunity to customise your degree to suit your areas of interest.

With an innovative approach to teaching, opportunities for engagement with industry leaders and work experience program options, you will acquire the right skills and knowledge needed to secure a job, progress your career and realise your full potential.

Career outcomes
Our graduates are experienced in software development, familiar with networked systems and have an understanding of the underlying foundations of all modern computer-based technologies. Depending on your choice of study areas, opportunities also exist to gain specific expertise in information security, networks and communications, intelligent systems, data-centric computing or user experience.

Graduates work in a wide variety of roles such as:
• software developer
• systems analyst
• programmer
• mobile application developer
• website developer
• user experience designer
• network administrator
• security analyst
• computer scientist
• software engineer
• systems programmer
• data mining specialist.

Career opportunities are abundant with information technology being an integral part of all commercial, industrial, government, social and personal activities.

Your course

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>common units in the first semester</td>
<td>computer science knowledge in discrete structures, software development and networks</td>
<td>advanced concepts of algorithms and complexity</td>
</tr>
<tr>
<td>design and build principles and apply these principles in innovative learning spaces</td>
<td>application design and development skills</td>
<td>a major project that brings together your previously mastered skills</td>
</tr>
<tr>
<td>information technologies and their transformational impact</td>
<td>practical, hands-on experience and problem-solving skills</td>
<td>interdisciplinary and specialist skills via your second major/minor study units</td>
</tr>
<tr>
<td>sample the disciplines of computer science and information systems</td>
<td>choose a second major/minor study units</td>
<td></td>
</tr>
<tr>
<td>introduction to programming principles and computer-based systems</td>
<td></td>
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</tbody>
</table>

Professional recognition
Graduates are eligible for membership of the Australian Computer Society (ACS). ACS accreditation is internationally recognised by the Seoul Accord.

David Wearing
I chose QUT based on reputation. The infrastructure and the lab facilities were great. I also received a bursary that assisted in purchasing textbooks that I would have been otherwise unable to afford. I’m now with Google and get to enjoy lots of travel. In my role I’m a wearer of many hats— programmer, project manager, network engineer, systems administrator, security engineer and travelling resource. Google has, hands down, the best company culture with constant learning opportunities.
Bachelor of Information Technology
(Information Systems)

Information systems focuses on identifying organisational requirements for applications and acquiring effective systems solutions—whether custom designed and built or selected and implemented—to meet them. Skills involve the design, development and maintenance of large database applications for business, as well as the identification, purchase and implementation of packaged software which addresses business problems. It does not require in-depth knowledge of computer programming but rather specialised knowledge of databases and software.

Why choose this major?
This area of information technology involves interaction with people—identifying their needs and assisting them to design solutions to address these needs. These solutions could be new business processes, services, tools or a deeper understanding of how to create better ways of working. Modern information technology professionals need to understand how to shape the industries of the future through an effective blend of information technology and business knowledge.

You will develop your skills in working with people, data, business processes and technology to find innovative ways of making business more effective and efficient.

Career outcomes
Information systems graduates have skills in design, systems thinking, stakeholder engagement, and modelling and abstraction which position them to work as business analysts and information systems consultants, solving a range of organisational problems.

Depending on the study areas chosen, opportunities also exist in business process management, social media and mobile application development, as well as in careers as information technology innovators within enterprises, consulting companies or a new start-up. Graduates are also employed in roles such as domain experts, chief technology officers, chief information officers, managers, executives or entrepreneurs.

Professional recognition
Graduates are eligible for membership of the Australian Computer Society (ACS). ACS accreditation is internationally recognised by the Seoul Accord.

Year 1
• common units in the first semester
• design and build principles and apply these principles in innovative learning spaces
• information technologies and their transformational impact
• sample the disciplines of computer science and information systems
• introduction to modelling information systems and the business of information technology

Year 2
• information systems knowledge in business process modelling, business analysis and corporate systems
• application design and development skills
• practical, hands-on experience and problem-solving skills
• choose a second major/minor study units

Year 3
• advanced concepts of enterprise architecture
• a major project that brings together your previously mastered skills
• interdisciplinary and specialist skills via your second major/minor study units

Danielle Vaz
I always liked technology at school and marketing seemed fascinating. They’re also a killer combination together. While studying I also worked as a Google student ambassador, representing Google on campus and sharing internship opportunities with QUT students. Being involved with Google and getting to visit their HQ in Sydney was a truly incredible experience.

The value that I’ve personally gained from doing internships has been tremendous. I’ve worked with really experienced, accomplished professionals. Some of these people have become my mentors and given me real insight into my potential future career. On the last day of my internship with Deloitte I was offered a full-time role working in their digital team.

The availability of evening classes is not guaranteed.
Bachelor of Games and Interactive Environments

Learn about the games and interactive environments industry from industry professionals.

You will develop creative skills ranging from the technical to the artistic. Discover visualisation, interaction and communication techniques as applied to games and interactive media. You will gain experience in the whole process of game and interactive media development—from identification and evaluation of ideas, creation of design concepts, critiquing products, and analysing cultural impact and industry trends, through to the development and delivery of a final product.

This course offers a strong foundation in both entertainment technology and creative skills. Complement your studies with options in games programming including graphics programming and game artificial intelligence. Learn overarching programming concepts and problem-solving strategies, teamwork, and the ethical and social responsibilities of an interactive media professional.

Why choose this course?

This course is a collaboration between QUT’s Science and Engineering and Creative Industries faculties, so you will learn design and technology skills from the experts in their respective fields. You will develop expertise in your chosen major area of study—animation, game design or software technologies.

Games development is the fastest growing sector of the worldwide audiovisual market from a consumer perspective. Brisbane is a hub of games and interactive talent, producing games for a worldwide audience and attracting international recognition. One of the world’s most popular smartphone games, Fruit Ninja, was developed by Brisbane company, Halfbrick Studios. QUT graduates, Shainiel Deo, Phil Larsen and Luke Muscat, were the team behind the Fruit Ninja international success story.

Career outcomes

Depending on your specialisation, you may find employment as:
- games programmer
- games designer
- simulation developer or designer
- animator
- user experience specialist
- application developer
- quality assurance specialist
- sound designer
- mobile application developer
- 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.

Professional recognition

The software technologies major within this course is accredited by the Australian Computer Society (ACS). ACS accreditation is internationally recognised by the Seoul Accord.

Lisy Kane

Lisy Kane is the only Australian to be included in the Forbes 30 Under 30: Games list. The Forbes list recognises the talent and contribution of young entrepreneurs. Lisy is a producer for League of Geeks and also a cofounder of Girl Geek Academy, an international program that supports women in technology.

I chose to work with League of Geeks because of their aim for world-class video game development with an incredible studio culture. The best thing about my job is the travel—being given the opportunity to go to conferences like the Game Developers Conference (GDC) and PAX West and East is the best.
A QUT mathematics degree can lead to a variety of exciting professional careers. It provides powerful tools for analysis of today’s complex world and gives an insight into many significant real-world problems.

Mathematics is one of the oldest pure sciences and is the technical language of science, engineering and business. With qualifications in mathematics, employers recognise that you are equipped with the specialist analytical skills for today’s complex world.

Our undergraduate course combines underlying theory with modelling, computational skills and the latest computer technology. Skill development in communication, problem solving, critical thinking and teamwork form an integral part of our courses.

Solve real-world problems

Mathematics and statistics are used in our understanding of the real world and in the solutions to practical problems. The use of mathematics requires us to think logically and clearly about problems involving numbers, space and relationships, while statistics are used to describe data which are subject to error or uncertainty.

With the rapid development of technology and the onset of the information age, the study of mathematics and statistics has become increasingly important. The growth of computing has provided the basis for many mathematical developments.

The world of commerce and economics also relies on the widespread use of mathematics and statistics, as do the fields of science and engineering. Mathematics and statistics are therefore an essential part of everyday life.

Cutting-edge technologies

Students make use of sophisticated, workplace-relevant software, providing them with a solid grounding for future employment in research and industry where data analysis and modelling tools are becoming more prevalent.

Learn from the experts

QUT’s Mathematical Sciences School is a leader in delivering world-class teaching and research outcomes, offering you advanced and relevant courses designed for the real world.

Our lecturers are internationally renowned in the research areas of applied and computational mathematics, statistical science and decision science.

One of our focus areas is big data, and the fundamental challenges involved with turning data into knowledge. We plan to address these challenges as part of our involvement with the $20 million Australian Research Council Centre of Excellence for Mathematical and Statistical Frontiers. This collaboration aligns with our research strengths in data science, and computational modelling and simulation science. QUT is also involved in the simulation and analysis of complex systems ranging from biological structures through to transport networks, in conjunction with our multidisciplinary research institutes.

With strong international, national and university-wide collaborative links and a focus on solving real-world problems, our research enriches our undergraduate course content and delivery—providing you with up-to-date skills and knowledge. There is also scope for a research project with an academic mentor to cap off your studies.

Your mathematics degree

Choose your major

Your first year features foundation core units for all three majors. You will explore fundamental concepts in mathematical reasoning, statistics and modelling before making an informed decision about where you want your mathematics degree to take you. Once you have completed your foundation units you will choose your career direction, selecting from three majors—applied and computational mathematics, decision science, or statistical science. These majors will not only prepare you for a wide array of career paths but will also provide you with the foundation to advance your study through our postgraduate research programs.

Flexible study options

As well as choosing a major area of study, your degree also includes a second study option, which may be a second major, or two minors.

A second major complements your major studies and develop a significant depth of knowledge and expertise in two areas. Second majors include:

- applied and computational mathematics
- decision science
- statistical science
- computational and simulation science
- accountancy
- applied economics and finance
- logistics management
- physics
- chemistry
- biological science
- earth science
- environmental science.

Alternatively, you can undertake two minors: four-unit sets with intermediate to advanced level content which extend or supplement your major. Minors are available from within the faculty or from other areas of the university, and include experiential minors such as international exchange and the new minor, Science and Mathematics Education.

Your Bachelor of Mathematics degree

Your 24-unit mathematics degree is made up of three distinct parts:

<table>
<thead>
<tr>
<th>Mathematics core units</th>
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<td>Complementary study</td>
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</table>
Applied mathematicians and computational scientists are at the forefront of scientific and technological advancement in a variety of fields. This study area has contributed to new advancements and insights into areas such as:

• the electrical activity of the heart
• the growth of cancerous tumours
• wound healing
• cryptography
• coal seam gas production
• sugar cane production.

Why choose this major?
This course provides high-quality learning combining studies in mathematics with considerable involvement in real-world applications and computational simulations. The mathematical modelling and computer simulation techniques covered in this major are vital tools used for discovery, innovation and technological advancement in the modern world.

Career outcomes
You will find employment opportunities across a wide range of areas such as finance, investment, information technology, environmental management, health, marketing, logistics, defence, media, education and research. In addition to your knowledge and abilities in mathematics, you will also be highly valued for your analytical and problem-solving skills.

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.

Solene Hegarty-Cremer
I’ve always loved maths. It’s in every industry, all over the world and people often don’t realise how much you can do. I’ve worked at Boeing as a summer vacation intern on a mathematical model describing pilots’ ability to detect imminent collisions. It was very beneficial and I learnt a lot about what life as a mathematician may look like.

I’ve also completed two weeks in Cambodia with Engineers Without Borders. The program taught us about human-centred design and introduced us to Cambodian culture. We spent five days in homestays in a rural community, then shared our knowledge about how to reuse plastic waste. It was great to see how my skills as a mathematician could fit within an engineering team.
Brody Foy was Queensland’s 2015 Rhodes Scholar and is the seventh QUT graduate to receive the distinguished award. Brody completed an honours degree in computational mathematics at QUT, and is now studying at the University of Oxford in the UK. Receiving one of the world’s most prestigious and competitive scholarships gives Brody the rare opportunity to take a PhD in mathematics at Oxford and will allow him to help advance our understanding of lung cancer. His aim is to adapt existing models of human lung functions to incorporate diseases, and to ultimately simulate how lungs might recover after high-risk surgeries to remove tumours or repair tissue damage. The models could help predict patient outcomes and could guide the management of various lung diseases, such as emphysema or cancer.

Maths can be so powerful in helping us really explore how things work. I think the coolest applications of maths occur when it intersects with other fields, like science, engineering, computer science or health.
Decision science is a mathematical discipline that explores how to make appropriate and informed decisions about complex problems. It deals with how best to design, operate and/or predict behaviour of complex systems like people, machinery, materials and money in industry, business, finance, education, government and defence.

Mathematics graduates play integral roles in the workplace, developing mathematical models and numerical algorithms to answer what-if scenarios, and designing experiments to help guide research and improve processes.

Why choose this major?
The decision science major encompasses the study of quantitative techniques relevant to decision making in its broadest sense. You will employ a problem-solving approach using advanced analytical methods such as operations research, stochastic and mathematical modelling, and mathematical optimisation. You will also use a variety of software and improve your information technology skills. With an emphasis on human-technology interaction and focus on practical applications, decision science is a multidisciplinary field which overlaps with other areas—notably industrial engineering, operations management, economics and finance.

The coursework also introduces you to different industries and processes that greatly contribute to the economy and environment of nations around the world. These include manufacturing and production, management, healthcare, finance and economics, goods and services, infrastructure, transportation and logistics, mining and defence. This study area provides a foundation for a variety of careers and further study.

Career outcomes
Decision science graduates typically have a wide range of employment opportunities. The job markets for actuaries, and finance and operations research analysts have been strong in recent years and are expected to remain so in the future.

In addition, students with excellent grades can take advantage of many opportunities for postgraduate study. The decision science major prepares you for careers or further postgraduate study 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.

Kari Stuart
As part of AECOM’s simulation and analytics team, I help clients make key commercial decisions by providing quantitative solutions for their business. I enjoy using mathematics for real-life applications. I’m currently involved in the development of a vessel scheduling tool for the Port of Gladstone, which to my knowledge is the first of its kind worldwide. At QUT I was able to study operations research which is an emerging field of maths. It can provide a differentiating component to any business and I believe its popularity is set to grow.
Bachelor of Mathematics (Statistical Science)

Mathematics and statistics graduates use their analytical and problem-solving skills in a vast array of roles and settings to gain insights into many significant real-world problems. They can develop new financial products in the banking industry, optimise transportation schedules in today’s busy world, or help understand customer value in the commercial world. They can also aid scientific research by data mining to discover genetic links and pathways, or help to understand pandemic disease transmission.

Why choose this major?
Many of our academics are world leaders in research and have strong industry ties that ensure the relevance of teaching material and high-quality learning experiences.

The statistical science major will provide you with the methodology for analysing data using empirical, theoretical and computational tools. You will discover complex statistical techniques and concepts through applications and datasets from the real world, providing strong links between theory and application.

You will also gain a fundamental and thorough understanding of statistics and statistical methodology. You will develop the ability to apply such quantitative skills in real-world scenarios, preparing 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.

Your course

YEAR 1
- fundamental concepts in mathematical reasoning, statistics and modelling
- basic principles of computational mathematics, calculus and algebra
- understanding data analysis
- choose option study units

YEAR 2
- statistical science knowledge in probability and stochastic modelling, and regression and design
- advanced calculus and algebra skills
- practical experience working on real-world problems
- choose a second major or minor study units and build research capabilities

YEAR 3
- advanced concepts of statistical inference and techniques and modelling data
- a major project that brings together your previously mastered skills
- gain interdisciplinary and specialist skills via your second major/minor study units

Sasha Richards
I’ve always excelled at maths and get a crazy kind of adrenalin rush when something I’ve been trying to figure out finally clicks. There’s a great maths community at QUT. I tend to do my study in the STIMulate study spaces because I’m surrounded by incredibly intelligent people, who both inspire me and help me when I get stuck.

I’ve had lecturers from NASA, Microsoft and all-round leaders in their fields. They’re always eager to help and very approachable. They bring experience and examples to the classroom, helping to connect what we learn with why we learn it. All of the class problems and assignments are given real-life context, which helps you to fully understand the capabilities of the maths that’s being done.

The availability of evening classes is not guaranteed.
Science plays an increasingly important role in finding the answers to some of the big issues impacting the world today. If you have the passion to help change the world, a QUT science degree can make all the difference.

QUT is committed to tackling issues of global importance. By studying a science degree, you could help develop solutions within areas such as climate change, long-term ecological impacts, energy and geosystems, food security and water resource management.

You could be at the forefront of the latest discoveries using nanotechnology, or protecting plant and animal species for future generations.

As a QUT science graduate, you could advise world leaders on climate change, renewable energy sources or water shortage solutions that are effective, economically viable, ecologically sustainable and socially acceptable.

Employability

Our courses are designed in consultation with industry, government and the professions. At QUT you will not only learn theory, you will apply it to real-world situations, ensuring your skills will be in demand when you graduate.

Practical teaching

From the beginning of your course you can expect to spend quality time in QUT’s state-of-the-art laboratories learning the latest techniques and using equipment found in industry. You’ll learn about recent discoveries and innovative new technologies ensuring you graduate with the most up-to-date knowledge. Take advantage of dynamic new teaching spaces that encourage increased engagement between academics and students.

During your course you will learn at both QUT and in the workplace. Work integrated learning at QUT gives you an opportunity to combine workplace activities with academic study, assessment and support.

Gain hands-on, practical skills by going out in the field, collecting samples, data and materials, and exploring real-world examples.

Learn from the experts

Our lecturers are experts in their field and include award-winning teachers and world-renowned researchers. All have strong connections with industry through professional experience, applied research and consultancy projects.

Your science degree

With the wide range of study options, you can create your own personal science degree program, giving you the choice to develop sought-after professional skills, deepen your understanding of your major discipline, pursue an interest from across the university, or broaden your scientific understanding.

Choose your major

Whether you choose biological sciences, chemistry, earth science, environmental science or physics, your major will provide you with in-depth knowledge and expertise, preparing you for entry to the workforce or further study.

Not sure of your career direction? Your decision can be delayed until after you have sampled a range of science disciplines during your first year of study.

Science core units

Your studies in the first semester will prepare you for the remainder of your course. The units are closely integrated to ensure your learning is relevant and in context.

Grand challenges in science explores world events, problems or phenomena from a scientific perspective, discovering the many ways in which science is used and misused by practising scientists and the public.

Quantitative methods in science introduces you to, and develops quantitative skills in, analysis simulation and modelling which underpin all scientific practice. You will apply and augment your quantitative skills using real-world data you collected during field and laboratory work in Experimental Science and other units where relevant.

Experimental science units 1 and 2 focus on scientific discovery with field trips and practical laboratory work, working both individually and collaboratively. The field data and laboratory results will help you find solutions to research problems in the core disciplines of biological sciences, chemistry, earth science, environmental science and physics.

Your Bachelor of Science degree

Your 24-unit science degree is made up of three distinct parts:

<table>
<thead>
<tr>
<th>Science core units</th>
<th>6 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary major</td>
<td>10 units</td>
</tr>
<tr>
<td>Choose one of five majors</td>
<td></td>
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</tbody>
</table>

| Complementary study | 8 units |
| Second major or two minors |
Flexible study options

Make an informed decision about your course of study and enjoy the many challenges of science as a profession.

We encourage you to shape your future career path through complementary study areas. As well as choosing a major area of study, your degree also includes a second study option, which may be a second major, or a double minor option where you study two sets of four units.

A broad combination of majors and minors is available to you, along with vacation research and further study, giving you the opportunity to focus on niche areas such as the resource sector or gain versatility across multiple industry fields. Our academic team will support you in tailoring your study plan to meet your aspirations. Our staff are closely connected to industry and research, ensuring career advice and your degree are directly connected to current and future needs in the field.

Second study area options

Second study areas are constantly being developed, and the options outlined here are an example of the range of programs which may be available with science degrees in 2018. To check the latest options visit www.qut.edu.au/study/courses/bachelor-of-science

Second major (eight units)

Choose a second major and develop a significant depth of knowledge and skills in two discipline areas. You could pursue another concentration in a second science discipline, or explore different perspectives which might include:

- **Computational and simulation science** complements your primary major with studies in simulation, visualisation, mathematics and computing.
- **Innovation and entrepreneurship** provides students with knowledge and skills to support and enhance innovation, commercialisation of innovations and management of related business ventures.

**Science communication** provides grounding in a variety of types of writing and communication required by scientists in a complex media and political environment.

**Minor (four units)**

You might prefer to expand the breadth and depth of your studies by adding to your chosen science major with two minors. Minors include:

- **Astrophysics** gives you a window to the universe—if you want to use physics and physical methods to understand the known universe, this minor provides you with strong foundational knowledge.
- **Biotechnology and genetics** provides answers to many current and future challenges facing our world.
- **Environmental systems** examines the key processes associated with earth and environmental systems linking earth, soil, water and ecological systems, providing the opportunity to map and evaluate these systems at a range of scales.
- **Forensic sciences** is designed to extend knowledge into the area of forensics from crime scene to laboratory and in the courts.
- **Industrial chemistry** explores the link between chemistry theory, engineering application and project management.
- **Human health and disease** provides a broad and coherent overview of foundational knowledge related to aspects of human health and disease.
- **Medicinal chemistry and biology** is taught at an introductory level and is intended to have broad appeal to those interested in the science behind medicines, natural therapies, forensics as applied to the sports industry and environmental pollutants, the biotechnology industry and the bio-economy.

**Science and mathematics education** opens alternative career pathways by upskilling you with strong communication and education skills. This minor is unique to QUT and will enhance your own learning through teaching others and effectively communicating complex concepts in a variety of formats.

**Spatial science** plays a central role in societal understanding and appreciation of the importance of location with the measurement, management, analysis and presentation of spatial or location-based information describing the Earth, its physical features on both land and water, and our built environment.

**Wildlife biology** provides a thorough knowledge of wildlife biology from plants to terrestrial and marine animals, and ecosystems.

You can also gain additional knowledge, skills and experience in your chosen major. For examples of extension minors, see your chosen science major on pages 32-37.

**Diversify your study (four units)**

Broaden your studies to include minors that offer general knowledge and insights into specific areas. You can choose from a range of university-wide minors, or you might choose to learn a language, or experience the real world through overseas study and gain credit through an international exchange minor.

For more information on Bachelor of Science minors visit www.qut.edu.au/study/courses/bachelor-of-science
Bachelor of Science (Biological Sciences)

Biology is the study of life and living things—animals, insects, plants and microorganisms. It includes everything that breathes, grows and feeds us.

Biologists are curious about all these things and want to know how they work, and how to grow and protect them—how to get involved with life on this planet.

Biologists love a challenge. How will we feed a population of eight billion people in 2025? Can we use biological waste to solve our energy crisis? How can we protect our plants and animals from new and exotic diseases? How many rare species can we save from extinction?

Why choose this major?
You will experience some of the most advanced laboratories in Australia and be taught by staff who are at the top of their research fields internationally. You will also stay in touch with the real world, as guest lectures, site visits and opportunities for work integrated learning bring a strong industry flavour to the degree.

This course provides a strong foundation in the core biological sciences such as physiology, genetics, animal and plant sciences, and microbiology. It is designed to be hands on, to develop problem-solving skills through active learning, and to give an early appreciation of the way that many disciplines can be used to work on a problem.

Career outcomes
Graduates work in a wide range of public and private sector jobs, and in environments including offices, laboratories, farms, fields, factories, cities and forests.

Laboratory-based careers may include laboratory management, basic research, microbiology or molecular genetics. Farm and field-based work often entails animal management, plant breeding, entomology, marine biology, or pest and disease management. Industrial work can involve biotechnology to produce food, fuel or pharmaceuticals.

Extend your studies
Gain further insight and depth in your primary area of study by undertaking an extension minor. Example minors include:

- Biotechnology and genetics studies genes, their function and different applications in food production, human health and medicine, and the management of wild biological resources.
- Medicinal chemistry and biology provides the skills and knowledge required for a career dealing with medicinal compounds, environmental toxicology and forensics.

Professional recognition
Professional recognition can be achieved through membership of an appropriate scientific society, such as the Australian Society for Biochemistry and Molecular Biology, the Ecological Society of Australia, the Australian Society of Horticultural Science and others.

Tony Robinson
I’m a senior entomologist with the Department of Agriculture. The department protects the environment and animal, plant and human health from the risk of exotic pests and diseases.

I enjoy the interesting and challenging work, with a good mix of field, laboratory and office work. There’s always something new to learn in entomology and one of the most important things QUT taught me is critical thinking, and how to find and review information. It helped me get where I am today.
Chemists are involved in most areas of science, technology, environment and industry including medicinal drugs, nanotechnology, water and air quality and energy production.

Chemistry principles are fundamental to many other disciplines including biotechnology, environmental science, geosciences, materials science and food science.

At QUT you will study analytical, physical, organic and inorganic chemistry with an additional focus on modern applications such as nanotechnology, analytical chemistry and spectroscopy.

Why choose this major?
The QUT chemistry degree is a qualification that is known and respected. Many employers prefer QUT chemistry graduates, especially those with an extension minor in analytical chemistry, because of their advanced technical skills, experience with modern instrumentation and training in scientific communication. Our training in analytical chemistry throughout the chemistry degree is renowned nationally.

You will undertake comprehensive laboratory work including experiments using modern computer-based analytical instruments, and gain knowledge and experience in the health and safety aspects of handling chemicals. You will be guided by highly respected lecturers, many of whom are actively involved in cutting-edge research.

Career outcomes
Employment opportunities are diverse and you may become an industrial chemist, materials scientist, environmental chemist, quality control analyst, laboratory supervisor, food chemist or an organic/inorganic chemist. Your interaction with QUT experts in drug development, clay and minerals chemistry, renewable energy sources, nanotechnology, environmental monitoring and applications of modern analytical instrumentation may lead to careers in these areas.

QUT graduates are sought after by police and other forensics laboratories because of their extensive practical training using modern analytical instrumentation.

Extend your studies
Gain further insight and depth in your primary area of study by undertaking an extension minor. Example minors include:

Analytical chemistry is the theory and practice of chemical identification and measurement, which is a vital part of every chemist’s work.

Industrial chemistry explores the link between chemistry theory, engineering application and project management. You will gain the necessary skills and knowledge to enable your integration into major industries such as chemical, mining, gas, petroleum, pharmaceutical and manufacturing.

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

Vanessa Lussini
QUT researcher Vanessa Lussini loves the challenge of doing things no one has done before. As part of her PhD, she’s applied her knowledge of organic chemistry to the development of a compound that, when mixed with paint, signals when an aircraft needs repainting.

Paint is an important element in aviation—its coating keeps the metal body of an aircraft in good shape, protecting it from the damaging effects of sunlight, temperature change and water exposure. Repainting too often simply because it is scheduled adds weight to the aircraft.

Paint breaks down more quickly on some parts of a plane than others and Vanessa’s compound makes it easier for maintenance crews to identify where these potential weak points are by using black light scanners.

The availability of evening classes is not guaranteed.
The Earth is an amazing place, and for an earth scientist it offers a unique natural laboratory that covers space and time. Earth science is a multidisciplinary science that applies chemistry, physics, biology and mathematical tools to understand the Earth’s processes, decipher its past and predict its future. Earth scientists work to monitor changes in the Earth’s environment and suggest solutions to problems. Society depends upon how we understand and manage our planet which compels a need to know more about its processes, its resources, and its environment.

Earth science (also known as geoscience) blends the traditional fields of geology, physical geography and oceanography/hydrology. Geology describes the rocky parts of the Earth’s crust (or lithosphere) and its development. Physical geography, which studies the Earth’s surface, includes geomorphology, soil science and biogeoscience. The marine and freshwater parts of the Earth define the fields of oceanography and hydrology.

Why choose this major?
If you enjoy working outdoors and are interested in understanding how the world works, then you will find earth science a rewarding area of study. The earth science major blends problem solving and current research issues with theory and industry-related, hands-on field, laboratory and modelling work. This major provides you with a fundamental background to pursue a career in the resource, environmental or research sectors and will change your perspective on the world around you.

Career outcomes
Earth science is fundamental to most critical issues facing today’s and future societies—such as the supply of natural resources including energy, minerals and water for technological advancement and quality of life of a growing population, and the management and mitigation of climate change and natural hazards for a safe and sustainable society. An earth sciences qualification offers a diverse range of career opportunities. These include employment in industrial, government, and academic or education sectors. The energy sector (oil, gas, coal, geothermal), and exploration and mining sectors have continuing demand for earth scientists. Many earth scientists also find employment in environmental consulting companies tackling geotechnical, groundwater contamination, natural hazards or climate change issues.

Extend your studies
Gain further insight and depth in your primary area of study by undertaking an extension minor. An example minor is:

Geology provides an advanced level of theoretical and practical skills, as well as advanced field experiences using real-world and research examples and materials.

You may also wish to consider a minor in environmental science, biological sciences or any minor offered in one of the other science disciplines.

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.
Katrina Bourke

Katrina Bourke successfully applied for the NASA JPL Caltech internship, and while there carried out calibration and standards testing to prepare for soil sample testing on Mars.

I came across the internship through my masters supervisor. I worked with Dr Abigail Allwood, an alumnus of QUT who studied geoscience at QUT, the same degree I did. I actually started an environmental science degree which has common units with geosciences. At the end of the first year I found my passion for rocks and changed my major. I had a very engaging and passionate lecturer who drew me to geosciences and facilitated my learning. What sealed my interest was a field trip to New Zealand that included a visit to a recently erupted volcano.
We rely on our natural environment to sustain our lives and lifestyles. We continually need to improve our understanding and management of the natural environment to balance our development with wise management, while minimising impacts and degradation.

An understanding of the mechanisms controlling environmental systems provides the skills required to undertake scientific environmental planning and management, and to tackle problems such as local water quality and ecosystem impacts, soil erosion, catchment and groundwater use, or adaptation to global climate change.

Why choose this major?
The course is designed to provide hands-on skills and field experiences using real-world industry examples and methods to allow you to pursue a variety of careers as an environmental scientist.

You will experience day-long and extended field trips, and learn from guest lecturers from relevant government agencies, industry and QUT staff who regularly provide advice for industry, government and community groups.

Career outcomes
Environmental scientists work in urban, rural or remote settings in planning, management, monitoring and research. These roles are usually found in government departments and agencies, local councils, consultancies, and industrial and mining companies.

As a graduate you may be involved in:
- assessing resources
- implementing environmental impact programs
- analysing and interpreting environmental data
- formulating contingency plans.

You may also consult on the environmental impact of mining, tourism and urban development, rehabilitation and reforestation of degraded sites, ground water assessment and modelling, and marine science.

Extend your studies
Gain further insight and depth in your primary area of study by undertaking an extension minor. Example minors include:

**Environmental systems** examines the key processes associated with earth and environmental systems. The units link earth, soil, water, and ecological systems, and provide the opportunity to map and evaluate these systems at a range of scales.

**Applied ecology** is the study of the factors that influence the distribution and abundance of plants and animals. Ecological information is required for any question that asks why, where, and in what numbers plants and animals are found.

Ben English
QUT lecturers and tutors are amazing. They ensure you understand the content and are very approachable. They bring industry experience to their teaching and encourage you to find practical solutions to real-world problems. I have always wanted to change the world and QUT is giving me the tools and the environmental science and law knowledge I need to make a difference in my future career.
Physicists are involved in finding solutions to challenges facing our world including developing instruments for environmental monitoring, computer models for climate change prediction, and developing solar and renewable energy systems. Physicists are also addressing the world’s ever-increasing appetite for information and information processing through research into quantum computers, nanotechnology, lasers and photonics.

Physics deals with the natural laws and processes, and the states and properties of matter, energy, space and time. Areas of specialisation include mechanics, electromagnetism, lasers and optics, medical physics, computational physics, nuclear and radiation physics, astronomy and astrophysics, thermodynamics, quantum mechanics and relativity.

Why choose this major?
The course has a strong applied emphasis so you will spend a significant amount of time in the teaching laboratories. In each unit the theory will be supported by experimental work, and in your final year you will undertake research and gain exposure to the research laboratories through the Physics Research unit.

Career outcomes
Physicists are an asset to almost any industry, including research and development departments of manufacturing companies, mining and exploration companies, research institutions such as CSIRO and the Defence Science and Technology Organisation, government bodies such as the Bureau of Meteorology, environmental protection agencies and health departments, as well as schools, universities and hospitals. Physicists are also well suited to management and consulting roles in a range of technology-based industries.

Extend your studies
Gain further insight and depth in your primary area of study by undertaking an extension minor. Example minors include:

- Astrophysics gives you a window on the universe. You will be introduced to the fundamental concepts and key issues of contemporary astrophysics and study the origin, composition and evolution of the universe. You will also become familiar with the observational tools used for the exploration of the universe.

- Science communication will show you how to interpret and analyse information, to argue a case based on evidence and logic, and to communicate effectively in a variety of written and oral forms for news and other media platforms. You will become familiar with theories of language, rhetoric and persuasion.

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

Dr Gillian Isoardi
Dr Gillian Isoardi is a QUT lecturer and was part of a team of scientists trialling LED street lighting in Brisbane, Ipswich and Townsville. The team made power savings of up to 82 per cent with bright LED lighting that exceeded the Australian Standards road lighting requirements.

LED streetlights are evolving over the world and have already been installed in countries including the USA, Canada and the United Kingdom. In Australia public street lighting is the single largest source of greenhouse gas emissions for local government. LED street lighting offers significant energy savings of up to 60 per cent, demand reductions and large maintenance savings.

The availability of evening classes is not guaranteed.
Our unique combination of courses provides a learning environment that mirrors the emerging multidisciplinary trends of industry.

Whether you want to plan and deliver sustainable and innovative environments for a growing population or provide advice on the use, value, management and marketing of property, you have many options available to you as an urban development graduate.

Real-world teachers
Your teachers include real-world researchers involved in major commercial and government projects, part-time lecturers from local industry, and Queensland’s first planner in residence.

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.

Learn in the workplace
Work integrated learning at QUT gives you the opportunity to combine workplace activities with academic learning, assessment and support.

Your urban development degree

Choose your major
With a robust first-semester core unit structure exploring the built environment, up-to-date research methodologies, property development, and the basic principles of economics and law, you will have a solid understanding of urban development—allowing you to make an informed decision about how you want to tailor your degree.

Your Bachelor of Urban Development (Honours) degree
Your 32-unit urban development degree is made up of three distinct parts:

<table>
<thead>
<tr>
<th>Urban development core units</th>
<th>6 units</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Primary major</th>
<th>18 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose one of three majors</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Complementary study</th>
<th>8 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second major or two minors</td>
<td></td>
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</tbody>
</table>

Your property economics degree
QUT offers one of the few specialised property courses in Australia, the Bachelor of Property Economics. It has important set units for industry accreditation and the flexibility to match study selections with your career goals. Graduates may also be eligible to advance into the one-year honours program, offering a higher level of study and research.

Real experience
The degree is comprised of numerous experiential components to ensure you graduate with a solid knowledge and understanding of urban development foundation principles couched in practical and applicable experience. You will go on field trips, participate in site visits and undertake industry placement. In your final year, you will complete a significant and relevant capstone research project, integrating all of the skills you’ve learnt throughout your degree.
Bachelor of Urban Development (Honours)  
(Construction Management)

Construction managers are responsible for the coordination and supervision of the construction of large and often complex building projects such as low-rise and high-rise apartments, hotels, factories, office blocks, commercial buildings, schools and hospitals.

Why choose this major?
The construction management course at QUT is considered one of the best in Australia and is highly ranked internationally, and will provide you with the skills to manage resources and construction projects.

QUT’s construction management teaching staff have real-world experience in a variety of practical and theoretical contexts, and maintain engagement with industry professionals and organisations. You will regularly attend lectures and tutorials often delivered by the industry’s best frontline professionals. You will also undertake professional practice, learn problem-solving techniques using specific case studies and attend site visits to become a valuable work-ready graduate.

Career outcomes
A construction management degree can lead to a challenging and financially rewarding career. You may be employed in private organisations such as large construction and development companies or consultancies, or government departments.

Construction managers supervise construction, coordinate subcontractors, plant, materials and equipment, estimate costs and quantities of materials needed, and plan construction methods and procedures. They ensure the requisite standards of building performance, quality, cost schedules and safety are achieved in accordance with the building contract documents, and that building projects are completed on time and on budget.

Professional recognition
The course is accredited by the Australian Institute of Building.

Luke Hempenstall
In the third year of my degree, I was part of a six-person team given the opportunity to design an orphanage in Botswana, Africa. The Botswana Government representatives chose our design and we then travelled there to participate in and oversee its construction. Now I’m able to plan for and deliver sustainable and innovative outcomes for our growing population. Creating a tangible legacy is a definite career highlight, and the real-world experiences and up-to-date topics of my QUT degree gave me the edge to make that possible.

Your course

<table>
<thead>
<tr>
<th>YEAR 1</th>
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<tbody>
<tr>
<td>• understanding the built environment</td>
</tr>
<tr>
<td>• fundamental concepts in construction management</td>
</tr>
<tr>
<td>• introduction to structures and residential construction</td>
</tr>
<tr>
<td>• basic principles of urban development economics and law, building measurement and integrated construction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 2</th>
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</thead>
<tbody>
<tr>
<td>• construction management knowledge in commercial construction, construction-related law and building services engineering</td>
</tr>
<tr>
<td>• building measurement, estimating, design and business skills</td>
</tr>
<tr>
<td>• choose a second major or minor study units</td>
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</table>

<table>
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<tr>
<th>YEAR 3</th>
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</thead>
<tbody>
<tr>
<td>• increase construction management knowledge and skills in high-rise construction and advanced structural and formwork design</td>
</tr>
<tr>
<td>• business skills, contract management and construction legislation</td>
</tr>
<tr>
<td>• engage in your chosen second major/minor study units and build research capabilities</td>
</tr>
<tr>
<td>• work integrated learning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>• advanced concepts of strategic construction management, programming and scheduling</td>
</tr>
<tr>
<td>• a major project that brings together your previously mastered skills</td>
</tr>
<tr>
<td>• gain interdisciplinary skills via your second major/minor study units and specialist skills in advanced construction management and research methods</td>
</tr>
</tbody>
</table>

For more details about this course including course structure and units, visit [www.qut.edu.au/study](http://www.qut.edu.au/study)
Bachelor of Urban Development (Honours) (Quantity Surveying and Cost Engineering)

Your course

YEAR 1

- understanding the built environment
- fundamental concepts in quantity surveying and cost engineering
- introduction to heavy engineering and residential construction
- basic principles of urban development economics and law, building measurement and integrated construction

YEAR 2

- quantity surveying and cost engineering knowledge in complex construction techniques, methodologies and management issues
- analytical and technical skills in commercial construction, measurement, estimating and services, and heavy engineering
- choose a second major or minor study units

YEAR 3

- quantity surveying and cost engineering knowledge and skills in high-rise construction and technical aspects of construction activity
- business skills, contract administration, and cost planning and controls
- engage in your chosen second major/minor study units and build research capabilities
- work integrated learning

YEAR 4

- advanced concepts of quantity surveying and cost engineering, and risk management in the resource sector
- a major project that brings together your previously mastered skills
- gain interdisciplinary skills via your second major/minor study units and specialist skills in advanced quantity surveying and cost engineering, and research methods

James McMahon

QUT provided a vast knowledge base and array of skills to help prepare me for my job as a professional quantity surveyor. During my degree QUT helped me obtain a cadetship with leading firm, Turner & Townsend. Now I am employed by Turner & Townsend where I have worked on projects across a number of sectors including multiple defence projects, airport terminal developments, department store and supermarket refits, multiple hospitals and associated healthcare developments, large-scale parks and recreational facilities, and office refurbishments.
Bachelor of Urban Development (Honours)
(Urban and Regional Planning)

2017 OP/rank: 11/76
QTAC code: 412352 | Campus: Gardens Point | Duration: 4 years full time | Assumed knowledge: English (4 SA) | OP Guarantee: Yes | Entry: February and July

Urban and regional planners design and manage the use of land and natural resources to meet future human needs in a sustainable way. They plan large-scale projects such as new cities, suburbs, ports, recreational and industrial areas and transport routes, consulting widely among local communities and colleagues in related fields. Working with elected representatives, communities and other clients, they prepare and administer physical schemes that create better places and lives for neighbourhoods, cities and regions.

You may enjoy a career in urban and regional planning if you are interested in social, economic, environmental and cultural issues, art and design, using your imagination and being creative.

Why choose this major?
QUT is recognised for combining community involvement with design and implementation skills which are based on links with engineering, property economics, architecture and landscape architecture. You will work on inclusive community planning, integrated infrastructure provision, creative design and practical problem-solving projects run in collaboration with partners in local and state government, developers and local community groups.

Enhance your knowledge of urban and regional planning in areas such as urban design, property economics, architecture, landscape architecture, law or business management.

A flexible course structure allows you to choose minors to match your career aspirations and personal goals, and maximise your employment opportunities.

Career outcomes
You will have employment opportunities internationally, and in state and local government departments and agencies, large multi-stranded 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.

YEAR 1
- understanding and history of the built environment
- fundamental concepts in planning and design
- basic principles of urban development economics and law, urban analysis and land-use planning

YEAR 2
- urban and regional planning knowledge in site planning, planning-related law and planning processes
- business skills in negotiation and conflict resolution
- choose a second major or minor study units

YEAR 3
- application of design skills on a broader scale through urban design principles
- the importance of environmental analysis and planning, and transport planning
- engage in your chosen second major/minor study units and build research capabilities
- work integrated learning

YEAR 4
- planning theory and ethics, and real-world planning projects that move from the community through to the regional level
- a major project that brings together your previously mastered skills
- gain interdisciplinary skills via your second major/minor study units and specialist skills in advanced urban and regional planning and research methods

Lazarus Cinnabar
Lazarus grew up with a fascination for cities, their natural environments and how they were created. His urban and regional planning degree helped him land a graduate position in the Victorian Public Service Aboriginal Pathway Program. He now works with the Victorian Government Department of Environment, Land Water and Planning.

I love working on major transport projects that are helping to improve public transport and reduce congestion. These types of projects often have really tight timelines and deadlines, and I enjoy working under pressure. I also like that I am making a contribution to the development of metropolitan Melbourne.
Brittany Lauga

Brittany decided to study urban and regional planning because she was excited by the fact that planners get to be at the forefront of making our streets, neighbourhoods, cities and regions better places to live. She leads CQG Consulting’s planning, approvals and community engagement team and in 2013 was named Queensland Young Planner of the Year by the Planning Institute of Australia for her outstanding achievements in the delivery of complex projects.

QUT challenged me to see different perspectives and gave me the skills to work on amazing projects early in my career including a $600 million tourism development on Great Keppel Island. I learnt a lot about the Great Barrier Reef and also about engaging with the community. I ultimately want to be involved in policy development where I hope I can make an even bigger difference to the way we live, to our communities, and to the planning system.
Bachelor of Property Economics

Property is one of the major asset classes in a diversified investment portfolio, and is a crucial component in business operations of this nature. Property economists are skilled in the ownership, management, valuation and development of a range of property types. Property economists are experts in optimising the returns and performance of this specialist asset class.

Why choose this course?
QUT offers one of the few specialised property courses in Australia. Property economics at QUT is concerned with all aspects of property: investment, asset management, development, valuation and research, with a focus on finance and the commercial property market sector. You will gain hands-on, practical experience to supplement your theoretical knowledge.

This course has a focus on sustainable development and environmental and energy efficiency in all forms of property.

Career outcomes
As a property economics graduate you will have career opportunities in property valuation, property consultancy, strategic advice, real estate, banking and finance, property management and funds management in both the public and private sectors.

Careers in property economics may include:
- property valuer and adviser
- investment analyst
- development manager
- property and asset manager
- funds manager
- corporate real estate.

You may work in your own private enterprise or as an employee of property development, valuation, property management, professional services investment or property finance companies. Government departments and local authorities concerned with rating, compulsory acquisitions, property development or portfolio management also employ graduates of this course. Your work will usually combine a mix of office and field work.

Professional recognition
This degree has professional accreditation from the Australian Property Institute, the Valuers' Registration Board of Queensland, the Royal Institution of Chartered Surveyors, and the Board of Valuers, Appraisers and Estate Agents Malaysia.

Daniel O’Driscoll
The best part of the property economics degree is the industry experience brought by the lecturers and their focus on real-world issues.

As recipient of the QIC Global Real Estate Scholarship I was fortunate to work in QIC’s real estate business while studying and I found that the course material was directly linked to the tasks I was undertaking in my role.

QUT is renowned for bringing industry experience to the lecture theatre and for me this was a key reason for enrolling.
A double degree combines two bachelor degrees into a single course of study that allows you to specialise in two fields and pursue different interest areas. You’ll complete a double degree in less time than two single degrees, saving you time and money. Double degree graduates have a broader range of skills and knowledge, giving them a competitive advantage and greater career flexibility.

Most double degrees only take a year longer to complete than a single degree but this doesn’t mean you will have a heavier workload. Double degree students usually have the same number of units each semester as a single degree student. This is achieved by studying only the compulsory parts of each single degree and using your electives or optional units to complete your second study area.

**Engineering**

**Bachelor of Business/Bachelor of Engineering (Honours)**

2017 OP/rank 8/84  
Assumed knowledge: English (4 SA) and Maths B (4 SA)  
Duration: 5 years full time  
Entry: February

This double degree will develop your business skills and complement the qualities that make engineers tomorrow’s business leaders—problem-solving and real-world practical skills, a commitment to driving change through innovation and a focus on the future and continuous improvement. The combination of business and engineering creates a wide range of career opportunities in Australia and overseas. There is a growing demand for engineers with the technical expertise and management skills required to plan, design, construct and maintain engineering projects.

**Bachelor of Engineering (Honours)/Bachelor of Information Technology**

2017 OP/rank 9/81  
Assumed knowledge: English (4 SA) and Maths B (4 SA)  
Duration: 5 years full time  
Entry: February

This double degree combination produces graduates who have the knowledge and skills to practise as an engineer and IT professional, positioning you for a challenging and rewarding career within the global economy. You will be technically competent in the fundamentals of mathematics, science and engineering, with advanced knowledge in at least one specialist area of engineering. Your IT studies will equip you to build and apply creative, innovative IT solutions across diverse industries.

**Bachelor of Engineering (Honours)/Bachelor of Mathematics**

2017 OP/rank 6/89  
Assumed knowledge: English (4 SA) and Maths B (4 SA)  
Duration: 5 years full time  
Entry: February

Mathematics and engineering have always had close connections, but recent advancements in mathematics and statistics are increasingly being used to help solve complex engineering problems. Choose from any engineering major and enhance your engineering capabilities with skills in mathematical modelling, analysis and design to help solve complex problems. Development of skills in communication, problem solving, critical thinking and teamwork form an integral part of the course.

**Bachelor of Engineering (Honours)/Bachelor of Science**

2017 OP/rank 9/81  
Assumed knowledge: English (4 SA) and Maths B (4 SA)  
Duration: 5 years full time  
Entry: February

Combining engineering and science offers more career choices and flexibility. Not only will you explore real-world problems from multiple scientific perspectives, you will also develop an awareness of the important social, environmental and economic impacts of your engineering or scientific decisions. The course includes a design stream as well as a capstone project where you will design and build an engineering artefact using an advanced level of skill while developing your professional capability as an engineer. Your science studies have been carefully designed to give you the skills you need for success. Having depth of knowledge in a science discipline, such as physics, chemistry or environmental science, will enhance and complement your engineering capabilities.
Mathematics

Bachelor of Business/Bachelor of Mathematics

This course will be offered in 2018 with a revised course structure that is currently under review.

Accountancy, economics or finance are ideal business majors to accompany your mathematics degree as you will learn how to undertake the sophisticated economic and financial modelling that is fundamental to business and government decision making. Your mathematics degree will prepare you for a career in finance, investment, information technology, environmental management, health, marketing, logistics, defence, media, education and research. Graduates are highly valued for their analytical and problem-solving skills. Development of skills in communication, problem solving, critical thinking and teamwork form an integral part of the course.

Information technology

Bachelor of Business/Bachelor of Information Technology

Business is highly dependent on information technology infrastructure, so having the expertise in both areas makes you more attractive to employers seeking multidisciplined staff. Businesses look for staff who can communicate well from both the business and information technology disciplines, and your skills and knowledge will give you a competitive edge over other graduates. You will have the opportunity to complement your information technology studies with a business major in accountancy, advertising, economics, finance, human resource management, international business, management, marketing or public relations.

Bachelor of Creative Industries/Bachelor of Information Technology

Develop a suite of contemporary technology, digital media and creative skills. You will learn to merge the creative and imaginative with the technical to develop sophisticated and innovative digital products. You can choose to complement your skill set and diversify your studies through a range of information technology and creative industries areas of interest.

Deanna Hood

I loved the way that my mathematics and engineering degrees interacted and how each one kept me interested in the other one. You do come across mathematics subjects in engineering, but it’s presented in a totally different way. The skills are really compatible but moreover you end up with a unique mindset having studied in two discipline areas.

The skills you get at QUT can always be applied in a way that positively impacts society. For example, I’ve worked on a USB stethoscope for diagnosing pneumonia in developing countries, a robotic partner for children with handwriting difficulties, and a multi-robot simulator that makes advancing the state of the art possible even without physically owning a robot.

This course will be offered in 2018 with a revised course structure that is currently under review.
Bachelor of Information Technology/Bachelor of Laws (Honours)

QUT was my first preference as it offered the double degree that I wanted to study—IT and business. I was impressed by the number of industry links the university offered, enabling me to start networking early in my degree.

In addition to this, QUT offers many opportunities for students to connect with industry professionals through the classroom. My lecturers have lots of experience in the subjects they teach. For students, this means we get real-life links to the content we learn in our units.

Bachelor of Information Technology/Bachelor of Mathematics

Mathematics and information technology are interrelated disciplines. This double degree provides you with the knowledge and skills to develop solutions for complex problems to provide great benefits to society. In the first year you will build a foundation in mathematics and information technology, and then select integrated strands combining units from the areas of applied and computational mathematics, decision science and statistical science with the information technology specialisation of your choice.

Karthik Gounder

QUT was my first preference as it offered the double degree that I wanted to study—IT and business. I was impressed by the number of industry links the university offered, enabling me to start networking early in my degree.

In addition to this, QUT offers many opportunities for students to connect with industry professionals through the classroom. My lecturers have lots of experience in the subjects they teach. For students, this means we get real-life links to the content we learn in our units.
Games and interactive environments

Bachelor of Business/Bachelor of Games and Interactive Environments

2017 OP/rank 8/84
QTAC code 419692  |  Campus Gardens Point  |  Duration 4 years full time  |  Assumed knowledge English (4 SA) and Maths A, B or C (4 SA)  |  OP Guarantee Yes  |  Entry February

By combining these degrees you will not only expand your business skills but also your creative skills through the development of digital environments and other forms of interactive media. In the business component of this double degree, you will gain broad-based business knowledge and skills that will prepare you for any business role, along with the specialist skills and knowledge in your choice of business major. In the games and interactive environments component you will have the opportunity to develop your creative skills in the area of your chosen major.

Bachelor of Games and Interactive Environments/Bachelor of Mathematics

2017 OP/rank 6/89
QTAC code 418672  |  Campus Gardens Point  |  Duration 4 years full time  |  Assumed knowledge English (4 SA) and Maths B (4 SA)  |  OP Guarantee Yes  |  Entry February

You will have the opportunity to use your problem-solving skills to develop realistic games in a competitive gaming environment. A decade ago, people probably would not have noticed if the cape the game hero was wearing did not flap in the wind as he ran, or that the boxes in the corner of the room did not fall over when they are run into in a fight. Today, serious gamers notice and demand this type of realism in their virtual worlds. This is where your maths and problem-solving capabilities come into play. Complex formulae are used in games design to create realistic scenes, and knowledge of mathematics will certainly aid your understanding.

Bachelor of Science/Bachelor of Games and Interactive Environments

2017 OP/rank 11/76
QTAC code 419682  |  Campus Gardens Point  |  Duration 4 years full time  |  Assumed knowledge English (4 SA) and Maths B (4 SA)  |  OP Guarantee Yes  |  Entry February

The Bachelor of Science gives you the opportunity to collaborate with your peers and teaching staff to explore real-world problems from multiple scientific perspectives. Your major will provide you with in-depth knowledge and expertise in a scientific discipline, preparing you for entry into the workforce or further study. You can choose a science major from environmental science, earth science, biological sciences, chemistry or physics. In the games and interactive environments component you will complete core units in introductory design, games studies, professional skills and basic programming, and then choose a major. A large component of your study will involve working with a group to develop a significant piece of work using PC, mobile devices, consoles or virtual reality for your final-year project. You can choose a major from animation, game design or software technologies.

Ben McGhee

Mechatronics engineering is a great complement to IT. I chose to do a double degree so I could improve my skills and knowledge in both areas. I have the same contact hours each week as my friends doing single degrees, but I get to study two brilliant areas that I love. My double degree will also allow me to work in many different areas and be adaptable to changing job climates.
Science

Bachelor of Science/Bachelor of Business

2017 OP/rank 8/84  
QTAC code 419832 | Campus Gardens Point | Duration 4 years full time | Assumed knowledge English (4 SA) and Maths B (4 SA) | OP Guarantee Yes | Entry February

Through the combination of science and business, you will equip yourself for an exciting career at the cutting edge of scientific innovation within a range of public, private and non-profit industries. Your business degree will give you a broad base of commercial knowledge as well as the opportunity to major in a specific business area. This understanding of business makes you more attractive to employers, even if you wish to work predominantly in a science-based career.

Bachelor of Science/Bachelor of Information Technology

2017 OP/rank 11/76  
QTAC code 418322 | Campus Gardens Point | Duration 4 years full time | Assumed knowledge English (4 SA) and Maths B (4 SA) | OP Guarantee Yes | Entry February

This double degree prepares you for an increasing range of careers that involve the application of information technology to science, and gives you the ability to use creative as well as analytical methods to solve scientific problems. As a graduate, you can expect to work in roles such as scientific modeller, engineering software developer, scientific programmer and computational scientist.

Bachelor of Science/Bachelor of Laws (Honours)

2017 OP/rank 5/91  
QTAC code 419712 | Campus Gardens Point | Duration 5.5 years full time | Assumed knowledge English (4 SA) and Maths B (4 SA) | OP Guarantee Yes | Entry February

Students choose the science and law double degree to give themselves flexibility in career choices. You will graduate with a wide variety of research, communication and analytical skills that can be applied in both the science and legal professions. Combining these two disciplines means you can enhance your career prospects by specialising in a particular field of knowledge related to science and law, using your scientific knowledge in a law field, or by applying your legal knowledge to an area of science.

Bachelor of Science/Bachelor of Mathematics

2017 OP/rank 6/89  
QTAC code 418712 | Campus Gardens Point | Duration 4 years full time | Assumed knowledge English (4 SA) and Maths B (4 SA) | OP Guarantee Yes | Entry February

Studying a double degree in science and mathematics will provide you with advanced knowledge and skills that are highly sought after by employers. A stronger training in mathematics and statistics enhances your capabilities in modelling analysis and design. Graduates find work in a diverse range of exciting fields including natural resources, agriculture, genetics, chemistry and biochemistry, infection and disease control, bioinformatics, physical measuring and imaging techniques.

Hannah Fas

I’m studying science and law, an uncommon combination—there aren’t many others in my cohort. Having two degrees makes you very employable. Specialising in two different fields positions you as an attractive candidate for jobs in a variety of industries.

All my tutors and lecturers are experts in their respective fields, and often are still practising, so they bring real-life work experience into the classroom. My law tutors tell us about cases they’re working on, and my science lecturers explain results from their experiments. I enjoy using both sides of my brain every day, and thinking in two completely different ways. One minute I’ll be solving a chemical equation; the next minute I’ll be analysing a piece of legislation. It definitely doesn’t get boring.

For more details about these courses including course structure and units, visit www.qut.edu.au/study
Honours programs

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

Bachelor of Information Technology (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

Bachelor of Science (Honours)

Campus: Gardens Point  | Duration: 1 year full time, 2 years part time  | Entry: February and July

Bachelor of Property Economics (Honours)

Campus: Gardens Point  | Duration: 1 year full time, 2 years part time  | Entry: February and July

Why choose honours?
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), and provides a wider 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.

Entry requirements
To be eligible for an honours course, you must have a bachelor degree in information technology, mathematics, science or property economics (depending on the course) or its equivalent, completed within the last five years, with a minimum grade point average of 4.5 (on QUT’s 7-point scale).

Course design
Each course has the option of an expanded research or extended coursework stream which is chosen depending on your area of research, and in collaboration with your supervisor. The core of the honours program is a research project that will provide you with the opportunity to learn about research by conducting a research project with an experienced researcher who acts as both supervisor and mentor.

You will learn the types of processes, creativity and analytical thinking that lead to advances in society and how to communicate such findings in a rigorous, systematic manner.

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.

Abbey Hoswell
I’ve just finished my honours project on developing a novel resistance strategy against tomato yellow leaf curl virus at the Centre for Tropical Crops and Biocommodities.

The skills that I have gained from QUT, such as public speaking and being able to independently complete a task, will definitely put me in a good position to apply for different research jobs in both science and medical fields.
How do I apply?

1. Find the course that suits you
To find a course that suits you:
- research courses online
- use our online quiz, Match My Skills, to find QUT degrees that best match your interests and abilities
- try it first by studying university units in Year 12 through the START QUT program.

Access decision-making advice at www.qut.edu.au/study/undergraduate-study

2. Check you meet the entry requirements
How selection is made  Applicants are selected for courses in order of academic merit, with OPs and ranks treated equally. OP and rank cut offs published by institutions should be used as a guide only. Cut offs can change from year to year depending on the number of applications, the standard of the applicants (OP/rank) and the number of places available in the course (quota).

Assumed knowledge  For most courses, QUT has an assumed knowledge scheme for domestic students. This means that we don’t use specific school subjects as entry criteria for our courses, however we assume you have the knowledge either through high school subjects or bridging courses. Check the assumed knowledge for your course on pages 51–52. If you do not have the assumed knowledge we strongly recommend preparatory studies through QUT or other recognised providers. For more information visit www.qut.edu.au/assumed-knowledge

English language proficiency  If you are a domestic student, you will meet the English language proficiency requirements so long as you have completed secondary schooling in Australia, or completed one year of full-time accredited diploma-level studies in Australia with a grade point average of 4.0 or above (on QUT’s 7-point scale). If your first language is not English and you have not previously undertaken either senior schooling or higher study in the English language, you must demonstrate your English language proficiency. Visit www.qut.edu.au/assumed-knowledge

3. Investigate the entry programs
Educational disadvantage  If you have been disadvantaged in your education, bonus OPs or ranks may be awarded through the Educational Access Scheme (EAS), making you more competitive for course entry. You can receive up to three bonus OPs (or six ranks) for each category with a maximum of five bonus OPs (or 10 ranks) for multiple EAS categories. You apply for EAS on your QTAC application.

If you are successful when applying for the financial hardship category and you enrol to study at QUT, you will also receive a guaranteed $3500 QUT Equity Scholarship.

Aboriginal and Torres Strait Islander students  The Oodgeroo Unit assists Aboriginal and Torres Strait Islander applicants with an entry program that recognises life experiences, any study undertaken, and potential, skills and commitment. If you have identified 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.

Elite Athlete Entry Program  If you are an elite athlete, sportsperson, manager or coach, you can apply for QUT’s Elite Athlete Entry Program, which offers a bonus of up to three OP bands or six entry ranks to eligible applicants.

Entry Bonus Scheme  QUT will offer bonus ranks for successfully completing certain school subjects, or completing a university subject while at school (e.g. START QUT) for students in Year 12 or equivalent in 2017 and applying for entry in 2018.

For more details about these entry programs visit www.qut.edu.au/special-entry

4. Check the costs and scholarships
Course costs are published on the QUT website by 1 October each year. Check the course information at www.qut.edu.au/undergraduate-scholarships

QUT is proud to offer a broad range of scholarships to reward and support students and we encourage you to apply. For more information visit www.qut.edu.au/undergraduate-scholarships

5. Apply for entry
Applications for QUT undergraduate courses are made through the Queensland Tertiary Admissions Centre (QTAC) online service. For more information visit www.qtac.edu.au

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

6. Accept your offer
You will be notified by QTAC if you receive an offer. Once you have accepted your QTAC offer, you can enrol online at QUT.

QUT allows domestic applicants to defer the start of their study for one year, except in courses using specific admission requirements such as portfolios, audition, prior study or work experience, or where course changes do not permit deferment. In special circumstances, QUT may grant a further deferment of up to 12 months. Visit www.qut.edu.au/deferment
## Science and engineering at a glance

<table>
<thead>
<tr>
<th>Course</th>
<th>Campus</th>
<th>QTAC code</th>
<th>Duration (years)</th>
<th>Assumed knowledge</th>
<th>2017 OP cut off</th>
<th>2017 rank cut off</th>
<th>Preparatory studies for students without the specified assumed knowledge</th>
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<tr>
<td><strong>Single degrees</strong></td>
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<tr>
<td>B Engineering (Honours) with majors in Civil, Computer and Software</td>
<td>GP</td>
<td>412502</td>
<td>4F</td>
<td>English (4 SA) and Maths B (4 SA) and Maths A, B or C (4 SA)</td>
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<td>Medical, Process</td>
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<tr>
<td>B Games and Interactive Environments with majors in Animation, Game</td>
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<td>3F</td>
<td>English (4 SA) and Maths A, B or C (4 SA)</td>
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<td>76</td>
<td>★ ★</td>
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<td>Design, Software Technologies</td>
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<tr>
<td>B Information Technology with majors in Computer Science, Information</td>
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<td>3F</td>
<td>English (4 SA) and Maths A, B or C (4 SA)</td>
<td>11</td>
<td>76</td>
<td>★ ★</td>
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<tr>
<td>B Mathematics with majors in Applied and Computational Mathematics,</td>
<td>GP</td>
<td>418701</td>
<td>3F</td>
<td>English (4 SA) and Maths B (4 SA) Recommended study: Maths C</td>
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<td>B Science with majors in Biological Sciences, Chemistry, Earth Science,</td>
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<td>4F</td>
<td>English (4 SA) and Maths A, B or C (4 SA)</td>
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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 [www.qut.edu.au/study](http://www.qut.edu.au/study)

**Footnotes**

- F = full time
- P = part time
- CPE = Continuing Professional Education
- GP = Gardens Point
- KG = Kelvin Grove

The availability of evening classes is not guaranteed.

- Maths: QUT unit *Modelling with Introductory Calculus* as a visiting student or QUT CPE course *Mathematics Bridging*.
- English: Students who do not have the assumed knowledge requirements in English, or have not successfully completed a year of vocational or tertiary study, should consider an English bridging course.
- Chemistry, Physics, Biology, Earth Science, Geography, or Maths C. Chemistry: QUT unit *General Chemistry* as a visiting student or QUT CPE course *Chemistry Bridging*.
- Physics: QUT unit *Physics of the Very Large* as a visiting student or QUT CPE course *Physics Bridging*.
- Biology: QUT unit *Foundations of Biology* as a visiting student.

4 SA indicates that you must have studied the subject over four semesters and achieved an overall exit assessment of sound achievement or better.

For further information visit [www.qut.edu.au/assumed-knowledge](http://www.qut.edu.au/assumed-knowledge)

The 2017 OP and rank cut offs 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. For the latest course information visit [www.qut.edu.au/study](http://www.qut.edu.au/study)
Distinguished Professor Kerrie Mengersen
Big data and statistics

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 for Excellence for Mathematical and Statistical Frontiers and the Peruvian-based Lupunalius 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.

QUT robot defending the reef

QUT roboticists have developed the world’s first robot to seek out and control the Great Barrier Reef’s crown-of-thorns starfish (COTS), which are responsible for an estimated 40 per cent of the reef’s coral decline. Dr Matthew Dunbabin and Dr Feras Dayoub have demonstrated COTSbot can autonomously detect and fatally inject COTS and are now working with philanthropists to adapt the robot for use by citizen scientists in coastal communities.
Science and Engineering

Please ask us
Science and Engineering Faculty
Phone 07 3138 8822
Email sef.enquiry@qut.edu.au
www.qut.edu.au/science-engineering

HiQ Contact Centre
Live chat www.qut.edu.au/student-centres
24/7 answers ask.qut.edu.au
Email askqut@qut.edu.au

International students
Australia Freecall 1800 181 848
Phone +61 3 9627 4853
Fax +61 3 9627 4863
www.qut.edu.au/international

Please visit us
HiQ Service Points
The HiQ Service Point on each campus can assist you with general enquiries about admission, academic credit, enrolment, fees, student ID cards and other matters.

Gardens Point
2 George Street, Level 3, V Block
8am–6pm Monday–Friday,
9am–5pm weekends

Kelvin Grove
Victoria Park Road, Level 2, R Block
8am–6pm Monday–Friday,
9am–5pm weekends

Caboolture
Tallon Street, Ground Floor, J Block
8.30am–4.30pm Monday–Friday

www.qut.edu.au

2017 calendar of events
Quito staff and students will be available at the following events to answer your questions.
You can sign up to receive email reminders about upcoming events at www.qut.edu.au/study/events

Regional Careers Markets
May–August
Queensland and New South Wales

Parent Information Seminars
16 May, 6–7.30pm
Gardens Point campus
17 May, 6–7.30pm
North Lakes Community Centre
18 May, 6–7.30pm
Caboolture campus

Careers and Employment Expo
2–3 June
9am–3.30pm Friday
10am–4pm Saturday
Brisbane Convention and Exhibition Centre

TSXPO (Tertiary Studies Expo)
15–16 July, 10am–4pm
Brisbane Showgrounds

QUT Open Day
30 July, 9am–3pm
Gardens Point campus

QUT Caboolture Campus Open Day
20 August, 9am–2pm
Caboolture campus

Return to Study Seminars
12 September, 6–7.30pm
Gardens Point campus
13 September, 6–7.30pm
North Lakes Community Centre
14 September, 6–7.30pm
Caboolture campus

Holiday Campus Tours
22 September, 9am–1pm
Gardens Point and Kelvin Grove campuses

QUT Real Decisions
19 December, 9am–1pm
Gardens Point campus
19 December, 1–4pm
Caboolture campus

International students
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 www.qut.edu.au/international

CRICOS No.00213J

QUT is committed to sustainability. The paper used in QUT Science and Engineering Course Guide 2018 has the credentials:

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