

Careers in Engineering



Why study with us?

As one of the most comprehensive engineering degrees in Australia, UQ's Bachelor of Engineering (Honours) and Bachelor of Engineering (Honours) / Master of Engineering programs will put you at the forefront of established and emerging engineering disciplines.

These industry-relevant, hands-on and dynamic programs provide a strong foundation in mathematics, science and engineering design, empowering you to meet the demands of the future. As a UQ-qualified engineer, you will have gained the critical skills and knowledge to develop practical solutions that impact the world we live in.



#1 in Australia

UQ Engineering is rated first in Australia for overall teaching quality

Student Experience Survey 2022



Top 100

in the world for Architecture/ Built Environment courses

QS World University Rankings by Subject 2023



Work anywhere in the world

Our qualifications are recognised internationally, allowing graduates to work anywhere in the world



Getting you employed is our top priority

UQ is the best in Queensland for graduate employability

QS Graduate Employability Rankings 2022



\$1 million

worth of scholarships and prizes awarded annually



Contents

Why study with us?	Inside front cover
Where are you going?	2
Focus areas	3
Degrees to get you there	4
Advanced Manufacturing	6
Built Environment	8
Digital Design + Technology	10
Sustainable Energy	12
Environment	14
Health	16
Resources	18
Space	20

School of

Chemical Engin

Disclaimer Disclaimer The information in this Guide is accurate as at July 2024. However, the University has many programs and courses, and refreshes and updates its programs and course offerings from time to time and without notice. It is your responsibility to visit study.uq.edu.au for up-to-date information.



UQ acknowledges the Traditional Owners and their custodianship of the lands on which UQ is situated. - Reconciliation at UQ

Where are you going?

A career in engineering can be extremely rewarding, where you'll be at the forefront of design, development and implementation.

At UQ, we will teach you the skills you'll need to meet the world's most complex challenges and engineer a better future for us all. We will empower you with the fearlessness and creativity to innovate where others fall short.

The demand for innovative and forward-thinking engineers has never been so great.

Skills you need





Problem-solving

Innovation

Communication

÷

-

E D O D D

Analytical thinking

දුරිදු

Creativity

မှိပိုမှိ Teamwork



Critical thinking



Focus areas



Advanced Manufacturing

Be a part of a growing industry – think manufacturing of food and beverages, natural resources, plastics and automobiles.



Built Environment

Reimagine urban infrastructure, designing smart sustainable buildings or focusing on people and improving quality of life.



Digital Design + Technology

Hone your technological skills, master the digital, and prepare yourself for a lifetime of success in the digital design and technology space.



Sustainable Energy

Tackle our world's global energy challenges. Design new ways to harness and store energy for a sustainable future.



Environment

Gain a deeper understanding of our planet and how to protect, manage and maintain the delicate balance of life.

Health

Join the exciting world of biomedical engineering and develop materials, devices and processes that improve and save lives.



倁

 $\overline{\bigcirc}$

Resources

Through automation and sustainable processes, build the most environmentally-friendly and productive resource sector we've ever seen.

Space

A career in space could be anything from designing and manufacturing aircrafts, satellites and drones, to developing more efficient rockets.

Degrees to get you there

As one of the most comprehensive programs in Australia, UQ's engineering degrees will put you at the forefront of established and emerging engineering disciplines.

Bachelor of Engineering (Honours)

Entry Requirements

+ QLD Year 12 (or equivalent) English, Mathematical Methods, and one of Chemistry or Physics.

Dual degrees with the Bachelor of Engineering (Honours)

+ Arts

MAJORS

Aerospace

Biomedical

Bioprocess

- + Biotechnology
- Business Management
- + Commerce
- + Computer Science

Specialisations

- + Design
- + Economics+ Information Technology
- + Mathematics
- + Science



Bachelor of Engineering (Honours) / Master of Engineering

Entry Requirements

+ QLD Year 12 (or equivalent) English, Mathematical Methods, and one of Chemistry or Physics.

More information

Visit **study.uq.edu.au** or scan the QR code CRICOS CODE 080724A

⊘ ⊘



Computer			\oslash		\oslash
Environmental	\oslash	\oslash			
Geotechnical		\oslash			
Materials	\oslash			\oslash	
Metallurgical	\oslash				
Mining		\oslash		\oslash	\oslash
Structural		\oslash			
Transport		\oslash			
Water & Marine		\oslash			
MINORS					
Computing	\oslash	\oslash	\oslash	\oslash	\oslash
Data Science	\oslash	\oslash	\oslash	\oslash	\oslash
Design	\oslash	\oslash	\oslash		
More information					

Visit **study.uq.edu.au** or scan the QR code ^{CRICOS CODE 080734K}



Jake Warren, Bachelor of Engineering (Honours) / Master of Engineering (Mechatronic) student on placement at Coachair

Starting salary by study area*

Science + Mathematics **\$62,000**

Medicine **\$79,800**

Nursing **\$68,500**

Pharmacy **\$52,200**

Engineering \$71,500

Business + Management **\$65,000**

Law + Paralegal Studies **\$70,000**

* Undergraduate full-time median salary Graduate Outcomes Survey 2023

98% of UQ engineering graduates are employed

Graduate Outcomes Survey 2023

Careers in Engineering 2025 5



Advanced Manufacturing

As one of Australia's largest and most diverse industries, advanced manufacturing is a key part of our thriving economy.

Advanced manufacturing uses and integrates new technologies, design and innovative production systems to produce high-value products and smart services for sectors including agriculture, biotechnology, defence, foods, fuels, pharmaceuticals, consumer products and the resources industry.

The industry is currently in a period of exciting change. Advances in digitisation and automation mean these engineers are now working smarter, not harder, bringing their understanding and creativity to new process designs, supply chain management and maintenance.

At UQ, we're equipping our graduates with skills to re-think traditional manufacturing processes and implement new technologies such as advanced robotics, AI, and big data to improve the products we rely on every day and help create a better world.







Careers in Advanced Manufacturing

Are you passionate about making things work better and faster? An engineer who works in the advanced manufacturing industry makes the difference in designing the processes and machinery needed to optimise an organisation's manufacturing operations.

Imagine yourself collaborating with companies like Anatomics, Seafarms Group, Toyota, Electrolux, and Bayer.

These companies employ highly skilled chemical and mechanical engineers to use cutting-edge technology to meet tomorrow's needs.

See your work make a real impact on the world. With an engineering career focused on advanced manufacturing, you could create change in:

Chemical Engineering

- + Address environmental challenges such as waste treatment and pollution control.
- + Design and improve the transformation of raw materials into finished products.
- Research the application of nanotechnology in food processing, packaging, and delivery systems.
- + Develop low and net zero carbon solutions that are affordable, reliable, and sustainable.

Electrical Engineering

- + Implement systems that monitor energy efficiency within manufacturing plants.
- + Design smart devices that predict when equipment needs to be replaced.
- + Integrate renewable sources into a plant power grid.

Mechanical Engineering

- Make life-changing biomedical devices, such as the cochlear implant or insulin pumps.
- Use advanced robotics, 3D printing, and new technologies such as AI and machine learning to improve manufacturing processes.
- + Make bioproducts from waste resources, such as sustainable fuels, textiles, and building materials.

Mechatronic Engineering

- + Developing robots that will help humans produce more, with safety and quality.
- + Enhancing Computer Numerical Control (CNC) machines and laser cutters for more precision manufacturing.
- + Innovating production with cutting-edge 3D printing solutions



"Reflecting on all the opportunities I had – studying engineering, science and languages, being a student leader, an executive member for a student society, studying abroad in Hong Kong and representing the uni through dance – I've realised there truly is something for everyone at UQ!"

Pamela Cheok

Bachelor of Engineering (Honours) (Mechatronic) (Minor: Biomedical Engineering) / Bachelor of Science (Biomedical Science) / Diploma in Languages (Chinese)

Senior QA Validation Engineer, Abbott



Built Environment

Get ready to shape the world we live in.

As Australia's population grows and our built environments become more diverse, there's an increasing need for more space, bigger cities, and smarter structures.

These demands put significant pressures on our urban and natural environments.

At UQ, we're preparing our graduates to help design and build new environments that are beautiful, functional, and sustainable – to benefit communities and reduce our carbon footprint for a healthier world.







Careers in Built Environment

Imagine being the engineer who designs a bridge that becomes a city's landmark, or a system that provides clean drinking water to thousands of people.

In the building environment industry, you will bring to life the places where we live, work and play. Join leading companies like Lendlease, Nexus Infrastructure, Hutchinson Builders, AECOM, and Morphum.

They employ highly skilled civil engineers in the fields of environmental, structural, or transport engineering to design buildings, dams, airports, and transport networks, but also seek out specialists in areas including fire safety and water and marine engineering to protect and improve the natural environment while meeting the changing needs of society. Ready for a new challenge? With an engineering career focused on built environment, you could create change in:

Civil Engineering

- + Design green buildings that help to lower city temperatures.
- + Research heat-resistant materials to build fire-proof skyscrapers.
- + Assess traffic patterns and improve the flow of cities.
- + Provide safe drinking water to communities.
- + Create structures such as breakwaters and seawalls to prevent beach erosion.



"I was always infatuated with structures and architecture, I love city skylines and extraordinary engineering projects. I was lucky enough to have a teacher in high school who introduced the reality of engineering to me. I took his engineering course at school in year 11 and I knew I was set to be an engineer. UQ has a well-structured first year that allows you to get a taste of different engineering disciplines. As a result of this for me, the move into the civil and then traffic field was made clear."

Casey Schackow

Bachelor of Engineering (Honours) (Civil) Director, Velocity Traffic Engineering



Digital Design + Technology

Get ready to push the boundaries of imagination and creativity in a rapidly growing industry.

Innovations in the technology industry such as big data, blockchain, artificial intelligence, and virtual reality mean we are now able to process data faster and deliver solutions that better meet user needs.

They also bring new challenges. Engineers in digital design and technology are visualising, building and delivering advanced solutions to society's most pressing tech issues – cyber security, energy poverty, and data privacy.

At UQ, we'll equip you with the skills and knowledge to meet these challenges head on and design a better tomorrow.







Careers in Digital Design + Technology

Imagine yourself designing the next big thing in technology, changing the world completely. An engineer who works in the digital design and technology industry specialises in delivering solutions that touch every aspect of our lives, from health, to banking, retail, agriculture, mining, tourism, and transport.

Exciting opportunities await anywhere! Get ready to work in companies like Canva, Siemens, Uber, Google or Atlassian. Or why not develop your own start-up?

These companies employ highly skilled electrical, mechatronic and software engineers to design and produce systems, software, and products – everything from lifesaving medical devices to smart watches and self-driving cars.

Prepared to shape the future? With an engineering career focused on digital design and technology, you could create change in:

Electrical Engineering

- + Research medical imaging equipment for healthcare applications.
- + Develop new technologies for faster and more accessible internet.
- + Create smart devices for residential and industrial applications.
- + Build the computers that control satellites.

Mechatronic Engineering

- + Research pathways to improve remote surgery.
- + Transition the society into electric, self-driving cars.
- + Design robots that will help clean rivers and oceans.

Software Engineering

- + Develop new video games, consoles, graphics processing units (GPUs), and game engines.
- + Create innovative apps for the next generation of Virtual Reality (VR) and Augmented Reality (AR) devices.
- + Develop solutions for teaching STEM to students of all ages.
- + Protect everyone's data from cyber-attacks.
- + Provide safe drinking water to communities.
- + Create structures such as breakwaters and seawalls to prevent beach erosion.



"There are so many options within software engineering. As technology advances, programming is not restricted to engineering firms alone, as most industries now require some form of software development. This allows for a lot of flexibility."

Jessica Rock

Bachelor of Engineering (Honours) (Software) Software Engineer, Boeing



Sustainable Energy

Australia is a land like no other. We boast one of the most environmentally rich and diverse continents in the world. From scorched deserts to tropical rainforests, we are surrounded by land and oceans plentiful with life.

Providing sufficient and sustainable energy to meet the requirements of higher living standards and a growing population will require major advances in energy supply and efficiency in the future. Doing this while mitigating the risks of climate disruption will be even more challenging.

At UQ, our graduates are powering up with the advanced skills and knowledge to meet the energy needs of a changing world.





Careers in Sustainable Energy

Imagine yourself developing the batteries that power the vehicles of the future. In the energy industry, you will help Australia transition from fossil fuels to renewable sources like solar, wind, hydropower, or hydrogen, potentially reaching net zero greenhouse gas emissions.

Collaborate with companies like Origin, Ausgrid, Powerlink or Energex, who need specialists in environmental, computer or materials engineering to research and implement alternative energy sources, develop business models, and government policies that put people's needs first.

The future awaits! With an engineering career focused on energy, you could create change in:

Chemical Engineering

- + Research new technologies for renewable generation and storage.
- Design safer, more efficient, and sustainable chemicals and products in petroleum and petrochemical industries.
- Create technologies to capture CO₂ emissions from power plants and store safely within the natural environment.

Civil Engineering

- Incorporate renewable energy solutions and sustainable design principles into urban planning.
- + Design plants that convert waste into usable energy.

Electrical Engineering

- + Use automation to integrate renewable sources into the energy grid.
- + Design innovative systems that will make green buildings consume less electricity.
- Deploy energy storage systems to store excess energy generated from renewable sources.

Mechanical Engineering

- + Design machines that generate, convert and store renewable energy more efficiently.
- + Design and constructing various types of power plants.
- Work with heating, ventilation, and air conditioning (HVAC) systems for more comfortable and efficient buildings and homes.

Mechatronic Engineering

- + Make more efficient wind or hydropower turbines to maximise efficiency.
- + Design solar tracking systems that automatically adjust the position of solar panels.

Software Engineering

- + Use computer modelling and simulation tools to improve energy distribution systems.
- + Create algorithms to forecast energy generation from renewable sources, such as solar, wind, and hydroelectric power.
- + Develop software for monitoring and reporting CO₂ emissions.



"Electrical engineering was particularly appealing to me as I had a special interest in the power industry.

UQ has equipped me with the knowledge and practical experience I needed to kick-start my career. My role requires me to work closely with a multi-disciplinary team of engineers and clients to deliver innovative, clean energy solutions."

Neha Moturi

Bachelor of Engineering (Honours) (Electrical)

Generator Stability Assessments Engineer, Energy Queensland



Environment

Australia is a land like no other. We boast one of the most environmentally rich and diverse continents in the world. From scorched deserts to tropical rainforests, we are surrounded by land and oceans plentiful with life.

Meeting the challenges of managing and maintaining our continent's rich beauty, growing population and natural resources has never been more critical for us and the next generations to come.

At UQ, we'll show you how to embrace the challenges of tomorrow's changing world – in a way that benefits your career, the environment and communities all over the world.







Careers in Environment

Dreaming of a career that makes a significant impact on both sustainability and the economy? An engineer who works in the environment space can expect to become a specialist in environmental protection, management and safety, natural resource use and the energy sector, and the petroleum and petrochemical industries.

Imagine yourself working in companies like Thiess, Natural Carbon, GreenTech Services, The Dow Chemical Company, Cleanaway, and BioPower Systems.

These companies employ highly skilled chemical and civil engineers with a wealth of knowledge on how to integrate technical innovations, design and development with an understanding of natural systems.

Lead the way to a greener future! With an engineering career focused on the environment, you could create change in:

Chemical Engineering

- + Design cutting-edge, highly efficient and eco-friendly materials.
- + Establish innovative methods for recycling and repurposing waste materials.
- + Research new ways to convert captured CO₂ into new types of concrete.
- + Create strategies to mitigate environmental impacts in the public and private sectors.

Civil Engineering

- + Design bridges, roads and buildings that can resist severe storms and rising seas.
- + Contribute to shape new policies and make innovative ideas become reality.



"What I enjoy the most in my role is being out in the fields, understanding and problem-solving the various environmental challenges each site has, such as the impacts on flora and fauna, the receiving environment, communities, and human health. I find it rewarding to be a part of the meaningful shift towards sustainability in the resources industry."

Amy Tran

Bachelor of Engineering (Honours) (Civil and Environmental)

Graduate Civil and Environmental Engineer, Rio Tinto | AFR Top 100 Future Leader



Australia's health care system is one of the best in the world, providing safe and affordable care for all. But our system is facing significant challenges. Chronic disease, an ageing population, and the demand to improve health outcomes efficiently and sustainably all put pressures on our health care system.

As these demands grow so too does the need for bright engineers to design, develop and deliver improved prevention, diagnosis and treatment for illnesses.

At UQ, we're equipping our graduates with the skills to innovate new solutions, develop new technologies and imagine a healthier world.







Careers in Health

Imagine the innovation you could bring to the health industry as a biomedical engineer. You would improve and develop new drug delivery systems or implantable devices, or even create more reliable medical equipment, such as robotic-assisted surgery or 3D-printed tissues or organs.

Do you know what companies like CSL, Cochlear, Vaxxas, Microba and Sullivan Nicolaides Pathology have in common?

They look for talented engineers that can bridge the gap between technology, medicine, and biology, specialising in creating materials, devices, and processes for better health outcomes.

Motivated to save lives? With an engineering career focused on health, you could create change in:

Chemical Engineering

- + Develop cutting-edge technologies for new drug therapies and medicines.
- + Create materials that are compatible with human tissue for implants and prosthetics.
- + Develop treatments that keep people healthier and happier, without needing constant medical care.

Electrical Engineering

- + Design and build equipment, devices, and software that help doctors save lives.
- + Develop telemedicine systems and smart devices that enable remote patient monitoring.
- + Evaluate the safety, efficiency, and effectiveness of biomedical equipment.

Mechanical Engineering

- + Build robotic exoskeletons for physical therapy, and advanced prosthetic limbs with myoelectric control.
- + Design more affordable and reliable implantable devices like pacemakers, artificial heart valves, and joint replacements.



"I chose my degree because I wanted to do something in medicine but I also knew I was interested in engineering, so electrical and biomedical seemed like the perfect mix. Since graduating, I now work as a biomedical engineer with a team of technicians, engineers, and contractors in hospital facilities to install and commission equipment."

Evan Burns

Bachelor of Engineering (Honours) (Electrical and Biomedical)

Field Services Engineer, Device Technologies



Resources

Few challenges are more important than building a lower-emissions based, clean-carbon world. And, in a time when progress is vital, access to critical resources will drive the pace of change.

That future is already here - and we need engineers who can question every process and action.

You'll learn about the increasing role of data science and new technologies, and how to lead the digital transformation happening right across the sector.

Our aim is to produce graduates prepared to make an impact. To think innovatively about sustainable solutions that produce zero harm – and build the most environmentally-friendly and productive resources sector we've ever seen.



Careers in Resources

Imagine yourself supervising a fleet of autonomous mining robots. An engineer who works in the resources industry specialises in designing and developing equipment, machinery, and processes to optimise an organisation's mining operations. They can find themselves working in a wide range of industries, government departments and private consultancies.

Think companies like Sandvik, Anglo American, Rio Tinto, BHP, or Alcoa.

These companies seek professionals in the fields of mining and extraction, energy generation (covering renewable and non-renewable), equipment design and maintenance, rehabilitation and conservation initiatives, processing techniques, exploration activities, transportation, and export operations.

Ready to innovate the future of the resource sector? With an engineering career focused on resources, you could create change in:

Chemical Engineering

- + Implementing safety measures on chemical, gas, petroleum, and power plant operators.
- + Research methods to produce biofuels from renewable resources like biomass, algae, and waste materials, reducing reliance on fossil fuels.
- + Investigate new materials for resource industry applications.
- + Integrate principles of sustainability into oil and gas exploration.
- + Design methods of controlling the flow of oil and gas from wells.

Civil Engineering

- Develop efficient layouts for mines to optimise extraction processes and minimise environmental impact.
- + Use advanced technologies to manage mining operations and distribute resources.
- + Restore the mined land to its natural state or repurposing it for other uses.
- + Design and apply safety systems and protocols to keep workers and equipment safe.

Mechanical Engineering

- Design mechanical equipment, machines, components, products for manufacture, and plant and systems for construction.
- + Develop specifications for manufacture, and determine materials, equipment, piping, material flows, capacities and layout of plant and systems.
- Apply technologies for reducing the environmental footprint of mining operations.



Mechatronic Engineering

- Deploy drones to exploration and surveying, accessing hard-to-reach areas and collecting data with minimal environmental impact.
- Program machine learning algorithms to analyse large datasets from mining operations, identifying patterns and optimizing processes.
- + Develop AR and VR systems for training and operational support.
- + Use remote sensors and algorithms to monitor equipment health and prevent failures.
- + Design driverless tractors to improve mineral processing in the resources industry.



"Mining will always be a big part of our lives. Any kind of innovation that can change mining engineering for the better would be well received in the industry as this ultimately provides a flow-on positive effect to the consumers of mining – our society.

My favourite thing about being a mining engineer is how dynamic and fast paced my job is. Everyday I'm dealing with new challenges – it keeps it very interesting and I'm never bored!"

Gracie Liao Bachelor of Engineering (Honours) (Mining) Operations Engineer, South32



Space

Space is a broad and rapidly expanding industry that needs a huge range of skillsets and support to operate.

As well as designing aircraft, space vehicles and space stations, engineers also create and maintain the satellites that fuel our communications, banking, security and agricultural industries. They develop the software that powers robots and the materials used to build effective spaceships.

UQ is equipping tomorrow's engineers with the knowledge they'll need to take the space industry to new heights. You'll develop skills across in-demand fields such as robotics, automation and hypersonics and build powerful industry connections to help your career really take off.

What to study



Bachelor of Engineering (Honours)





Careers in Space

Imagine yourself designing the next generation of space shuttles, more affordable satellites for better communication or even monitoring water pollution on the Great Barrier Reef. In the space industry, space data and technologies also enable the modern economy to function by providing us with everyday essentials such as internet access, weather, and location information.

You obviously thought about NASA, but think about companies like SpaceX, EM Solutions, Southern Launch, Maxar Technologies or Saber Astronautics.

These companies employ highly skilled engineers with crucial specializations for addressing the multifaceted challenges of the space industry.

The opportunities are literally out of this world. With an engineering career focused on space, you could create change by:

Electrical Engineering

- + Design electronic and electrical systems for aircrafts.
- + Develop hardware for cybersecurity, wired and wireless communications, control systems, signal processing, and propulsion control.
- Design guidance systems, communication systems and networks, radar and ground stations or even entire satellites.

Mechanical Engineering

- + Create cutting-edge remotely piloted aircrafts.
- Research innovative materials, architectures, mechanisms, methods, and processes.
- + Work in hypersonics, aerodynamics, propulsion, guidance, navigation, and control.

Mechatronic Engineering

- + Deploy satellite subsystems, such as solar arrays, antennas, and other structures.
- + Contribute to the transition to electric aircrafts, including design, motor control, energy storage, and power distribution.
- + Develop robotic systems for aircraft inspection, maintenance, and repair tasks.
- + Build autonomous systems for space, terrestrial, and underwater hardware.

Software Engineering

- + Develop software that helps managing aircraft navigation, communication, and surveillance during flight.
- + Create new flight simulators to help train pilots and test aircraft designs.
- + Use machine learning predict weather and optimise schedules, plan flight routes, and avoid turbulence.



"What I didn't realise was there are so many different career opportunities within the industry. It's not just pilots, astronauts and engineers. It's operations staff, air traffic control, business, law – you name it."

Brock Little

Bachelor of Engineering (Honours) (Mechanical and Aerospace)/ Master of Engineering

Flight Test Aircraft Project Engineer, Joby Aviation



CREATE CHANGE

Want to know more?

Visit study.uq.edu.au

Disclaimer The information in this Guide is accurate as at July 2024. However, the University has many programs and courses, and refreshes and updates its programs and course offerings from time to time and without notice. It is your responsibility to visit **study.uq.edu.au** for up-to-date information.