

What can I do with a degree in Electrical and Electronic Engineering?

Electrical and Electronic Engineering.



Career planning: what do I need to know?

Knowledge of yourself is important for career decision making. Start by looking at your personal goals, abilities, values and interests to explore study and career options that are relevant to you. Some of these may change over time, so it is important to self-reflect and evaluate your career on an ongoing basis.

What do employers look for?

Many employers look for generic skills such as communication, customer-focus, bicultural competence, cultural awareness and teamwork. With technology and globalisation changing the nature of society, skills such as resilience, problem solving and adaptability are valuable at work as well as in life.

How can I develop these skills?

- Some skills are developed through your degree

- Extra-curricular activities can help, for example getting involved in clubs, mentoring, cultural groups, part-time work or volunteering
- Be open to professional and personal development opportunities. Whether it is undertaking an internship, overseas exchange, skills seminar, or joining an industry group — these activities will enhance your employability.

What else should I know?

The career options in this brochure are examples only and the list is not exhaustive. Some careers may require further study beyond a first degree or additional work experience. Some pathways and degrees have a recommended school background. Find more subject details at

📄 www.canterbury.ac.nz/subjects/enel

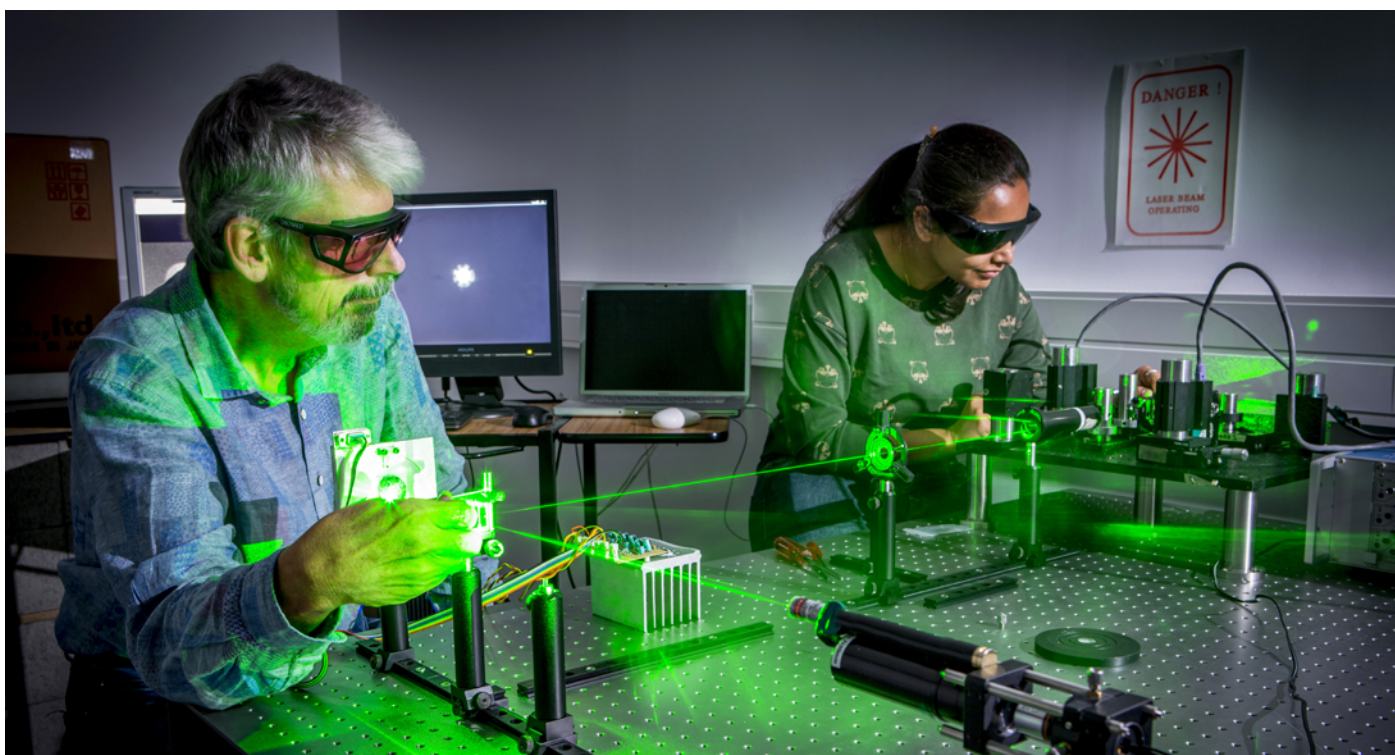
If this brochure does not answer your questions, talking to an expert such as a career consultant can help you to identify the next steps in your career decision making journey.

📄 www.canterbury.ac.nz/careers

What is Electrical and Electronic Engineering?

Electrical and electronic engineers harness one of the fundamental forces of the universe, electromagnetism, for the benefit of the world. They create systems to provide efficient and sustainable power for homes and industry, the physical parts that transfer information between computers, and also the smart miniature devices we now have throughout the modern world.

Electrical and electronic engineers have played a major role in the development of many technological advances, from personal computing and smart phones to autonomous vehicles and renewable electrical power. Digital television, unmanned aerial vehicles, robotics, medical imaging, and space exploration have all been possible in large part because of electrical engineering innovation.



AT A GLANCE

MORE

electrical and electronics engineers are needed in Aotearoa New Zealand*

98%

of electrical and electronic engineering graduates were in their ideal employment or working in a step in the right direction†

2050

is the target year to achieve net-zero carbon emissions‡

* Immigration NZ 2019 long-term skill shortage list www.skillshortages.immigration.govt.nz

† 2017, 2018, 2019 Graduate Destination Surveys combined

‡ MBIE Energy in New Zealand 20 report

What skills have UC graduates gained?

Through their Electrical and Electronic Engineering degree graduates develop valuable skills such as:

- Creativity and innovation
- Practical application of engineering technology and science
- Technical knowledge of electronic and electrical systems
- Programming software for embedded (smart) systems
- Coping with rapid technological changes
- Analytical and problem solving skills
- Logical and quantitative thinking.

Applied learning is an important part of your degree, through work placements, consulting projects and fieldtrips. These experiences can deepen your skillset, awareness of others, working knowledge and employability.

Where have UC graduates been employed?

Graduates are found in many industries such as:

- Telecommunications
- Electric power
- Nanotechnology
- Renewable/power engineering
- Communications
- Biomedical engineering.

UC graduates have found roles in :

- Information, media and telecommunications e.g., Tait Communications, Google, IBM, Apple, Vodafone New Zealand, Telogis, Assurity, Bloomberg, Spark, Alcatel-Lucent
- Manufacturers e.g., Dynamic Controls, Carter Holt Harvey, SALCOM, ABB, Agilent Technologies, Fisher & Paykel
- Electricity and energy services e.g., Meridian, Transpower NZ, Orion, Northpower, Electra, Marlborough Lines, Delta Utilities, Beca, AECOM, Electrix, Connetics, Transfield Services, Unison Networks, EDF Energy, Ergo Consulting, Mainpower, Vector Limited, Trustpower, Stronger Christchurch Infrastructure Rebuild Team, Contact Energy
- Professional, scientific and technical services e.g., Trimble Navigation, Opus International, Allied Telesis, Dynamic Controls, Dental and Medical Equipment, Telogis, UL International NZ, 2CLight, Rodin Cars, Aurecon, Martin Aircraft, IBM, Rocket Lab, Tekron International, Scott Technology, Airways NZ
- Tertiary institutions e.g., universities or their subsidiaries in New Zealand, Philippines, Malaysia, UK, Australia, Scotland, Tonga, USA, United Arab Emirates.

What jobs and activities do graduates do?

Electrical and Electronic Engineering graduates are well prepared to join the technological revolution – see some examples of career options below.

Note: Some of the jobs listed may require postgraduate study. See the 'Further study' section

Electrical engineer, graduate electrical engineer

- Designs systems to generate, distribute and manage electricity
- Tests electricity systems and resolves problems

Electronics engineer

- Researches, develops and designs electronic equipment and systems eg, circuits and software for medical devices, mobile phones, automated control systems, navigation systems

Power engineer, power systems engineer, power electrical engineer

- Plans and develops systems that supply power
- Tests and maintains these power systems
- Researches alternative sources of power

Software engineer, graduate software engineer

- Analyses customer needs, evaluates computer software and researches new technologies
- Identifies solutions and develops software programs for new products
- Manages software development projects

Communications engineer

- Designs and develops software for improved, more reliable communications
- Designs new communications data algorithms

Hardware engineer

- Designs the physical parts of computer systems
- Researches and tests hardware components
- Considers the costs of hardware to end users

Research engineer

- Evaluates and develops new systems and equipment in the electronics industry
- Makes recommendations to resolve problems
- Supports general organisational operations

Biomedical engineer

- Develops electrical and electronics systems for improved healthcare
- Designs new algorithms for medical imaging

Electrical / electronic technician

- Interprets instructions from an engineer
- Ensures these are implemented correctly
- Installs and maintains power-using equipment

Test analyst, validation tester

- Designs tests to check software/systems
- Identifies defects and bugs, and suggests fixes
- Records issues and tracks solution results

Network engineer, network assets engineer

- Develops computer networks that allow phone calls, internet access, TV and radio broadcast
- Designs infrastructure and systems to support it
- Ensures designs are implemented correctly

Project engineer, project manager

- Manages project plan, times, costs, compliance
- Manages procurement, purchasing, contracts
- Liaises with project staff and clients

Design engineer, junior design engineer

- Uses software/technology to develop new ideas
- Designs and tests prototype components
- Liaises with suppliers and manufacturers

Radio frequency engineer

- Forecasts future traffic resources needed
- Plans radio network changes and improvements
- Integrates front-end RF systems into other systems like aviation or aerospace

Entrepreneur & self-employment

Entrepreneurship and innovation are an increasing part of the working landscape. Through generating a business idea, or getting involved in a start-up/business venture, you have the potential to create a work opportunity that aligns with your knowledge, skills, values and risk profile. To get started on how to establish, run and grow a new business, go to Te Pokapū Rakahinonga | Centre for Entrepreneurship at the University of Canterbury www.canterbury.ac.nz/uce



What professional organisations can I engage with?

Connecting with professional bodies and organisations can help you to establish professional networks and learn more about different career options in your area of interest. Gaining valuable insight into a profession can assist in making informed career decisions.

- Institute of Electrical and Electronic Engineers www.ieee.org
- Engineering New Zealand www.engineeringnz.org
- Electricity Engineers' Association www.eea.co.nz
- The Association of Consulting Engineers New Zealand Inc. www.acenz.org.nz
- Electrical Workers Registration Board www.ewrb.govt.nz

Having a professional presence on social media networks such as www.linkedin.com and Facebook can help you to keep up to date with important industry developments and trends, networking opportunities, events and job vacancies. Following relevant professional bodies, organisations, companies and thought leaders is a great way to gain a deeper awareness of the industries that interest you. Social media presents an opportunity to build and enhance networks as well as to display your involvement in projects and any academic successes.

Why do further study and what are my options?

Postgraduate study can facilitate career benefits such as specialist skills, entry into a specific occupation, faster progression rate, and advanced research capability. Advanced study can lead to a career in research, or as a high-tech entrepreneur. It is important to determine which, if any, further study will help you in your future career.

Graduates can study Electrical and Electronic Engineering at master's and PhD level at UC. There are also programmes in Engineering Management and Renewable Energy. Research opportunities are available through the EPECentre, HITLabNZ, Wireless Research Centre, and Spatial Engineering Research Centre. For UC qualification listings visit www.canterbury.ac.nz/courses

Useful links

- Te Rōpū Rapuara | UC Careers www.canterbury.ac.nz/careers
- Careers New Zealand www.careers.govt.nz

Philipp



PhD in Electrical and Electronic Engineering
Chief technology Officer (CTO),
Kea Aerospace

What led to you to co-found Kea Aerospace?

I love both engineering and exploration. Working in the aerospace field is a perfect combination of both, where you have to push the boundaries of what is known and currently possible.

What's the best part about your work as a CTO?

I like the challenge and unknown parts of the job. We are doing something fairly new. No one has been commercially operating solar-powered stratospheric aircraft so far. Otherwise, I love the diversity of the job, from design work on a computer to manufacturing in a lab and flight testing outside.

What is your next big project?

We are developing a new unmanned high-altitude fixed-wing aircraft that will fly in the stratosphere at around 20km altitude, which, being fully solar powered, will operate for days or weeks per flight. With a wingspan of over 30m, it will likely be the largest unmanned aircraft designed in the Southern Hemisphere.

Right now, my job involves a bit of everything from the aircraft design and manufacturing to flight testing and regulatory work. Additionally there is of course more work on the business side of things.

How has UC supported your team?

We are getting amazing support from the Centre of Entrepreneurship (UCE) and their ThinkLab advisory team. UC was also the only place in the world where I could work on rocket control systems in a non-military context. Studying at UC was far more practical than in Germany. I was working with UC Aerospace during study – a great team of postgraduates.

Read more online

Read more stories about our students' university experiences online. UC alumni make a difference in varied ways around the globe. To find out where graduates are now visit www.canterbury.ac.nz/getstarted/whyuc/student-profiles

The information in this brochure was correct at the time of print but is subject to change.

More information

UC students seeking study advice.

Te Tari Pūhanga Hangarau | Department of Electrical and Computer Engineering

We have excellent facilities for both teaching and research in Electrical and Electronic, Computer, and Mechatronics Engineering. Staff are engaged in a wide range of research activities including communications, image and signal processing, biomedical engineering, electric power engineering, power systems, power electronics, microelectronics and nanotechnology.

T: +64 3 369 3366

E: engdegreeadvice@canterbury.ac.nz

www.canterbury.ac.nz/engineering/schools/ece

Anyone seeking careers advice.

Te Rōpū Rapuara | UC Careers

UC offers intending and current students and recent graduates a wide range of services, including individual career guidance, seminars, career resources and student and graduate employment opportunities.

T: +64 3 369 0303

E: careers@canterbury.ac.nz

www.canterbury.ac.nz/careers

Prospective students seeking study advice.

Te Rōpū Takawaenga | Student Liaison

The liaison team provide advice to future students who are starting their degree for the first time. They can assist with information on degrees, scholarships, accommodation, and other aspects of university life. We have offices in Christchurch, Auckland and Wellington.

Ōtautahi | Christchurch

T: 0800 VARSITY (0800 827 748)

E: liaison@canterbury.ac.nz

Tāmaki Makaurau | Auckland

T: 0800 UCAUCK

E: auckland@canterbury.ac.nz

Te Whanganui-a-Tara | Wellington

T: 0800 VARSITY (0800 827 748)

E: wellington@canterbury.ac.nz

www.canterbury.ac.nz/liaison

