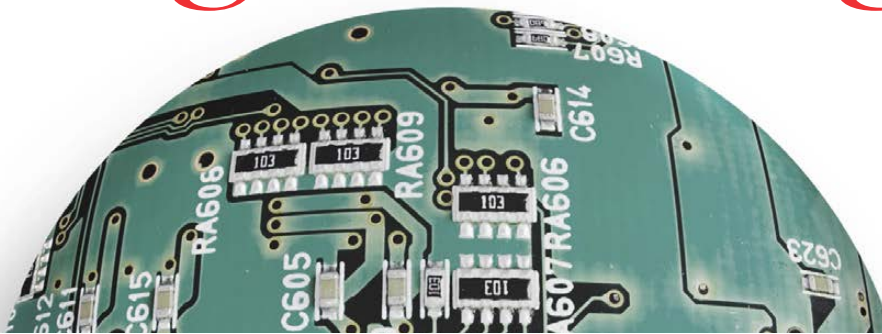


What can I do with a degree in Computer Engineering?

Computer Engineering.



What is Computer Engineering?

Computers are at the heart of most modern products, transforming them into devices capable of sensing, making intelligent decisions, and taking collaborative actions. Computer Engineering brings together elements of electronics and software to create the next era of smart devices and powerful AI computers.

Computer engineering involves using hardware and software knowledge, and creativity to solve real-world problems with application specific design.

Portable electronics, autonomous drones and cars, biomedical devices, household electronics, telecommunications, manufacturing and infrastructure, and high-performance AI computers are all associated with Computer Engineering.

Learn more

It is important to do some research when planning a future career. Speak with, ask questions of, and follow relevant professional bodies, organisations, companies, thought leaders and industry professionals to learn more about:

- Career opportunities, work environments and salary information
- Education and training requirements.

Examples of professional bodies

- Institute of Electrical and Electronic Engineers
www.ieee.org
- Engineering New Zealand
www.engineeringnz.org
- Association for Computing Machinery
www.acm.org
- Te Pou Hangarau Ngaio IT Professionals NZ
www.itp.nz

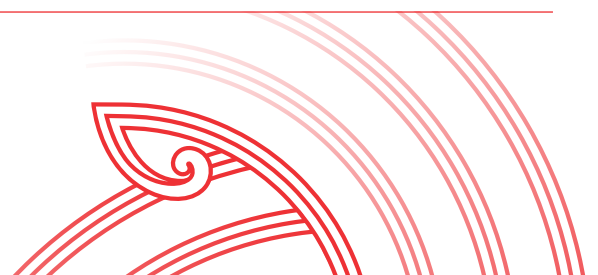
Career and study information

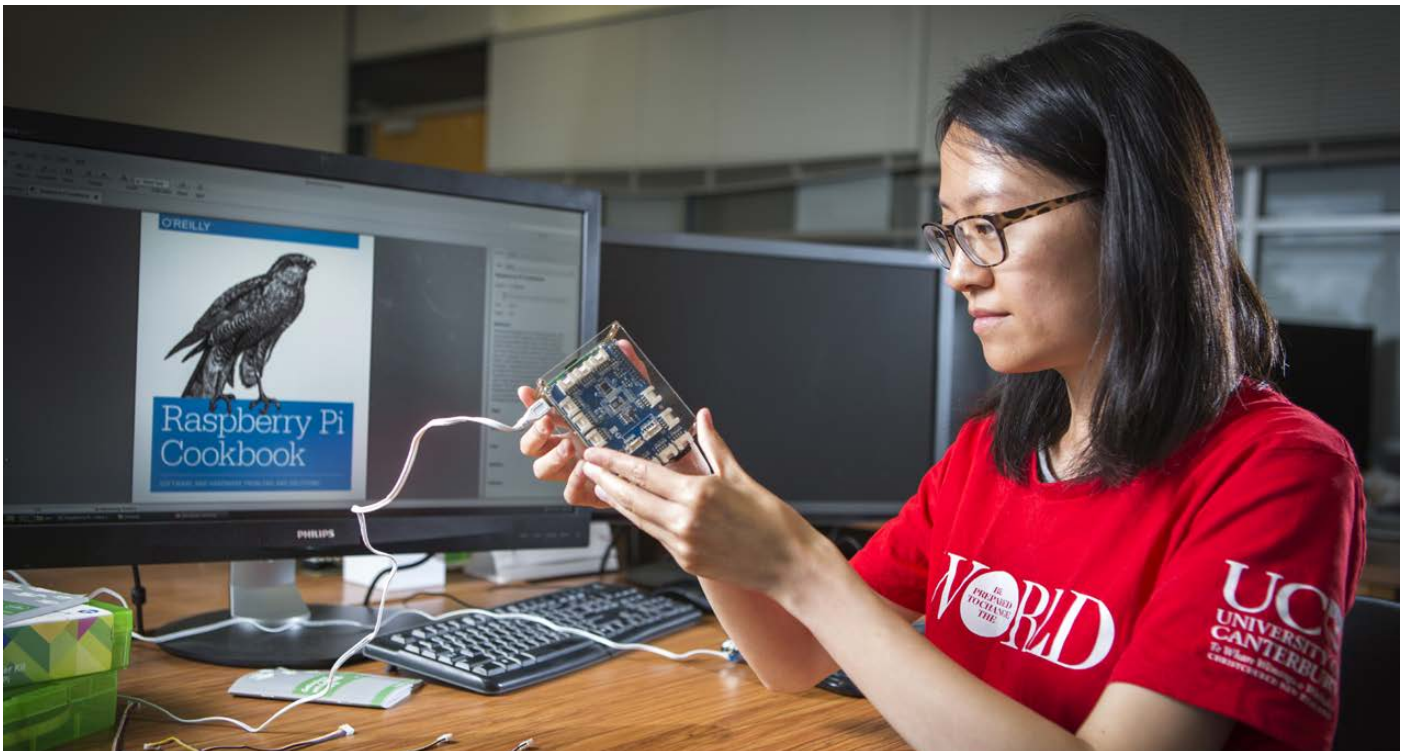
Some study pathways and degrees have a recommended school background, and some careers may require further study beyond a first degree or additional experience.

Gather helpful information from:

- Subject-specific content at
www.canterbury.ac.nz/beng-honours
- Job profiles on career websites like
www.careers.govt.nz
- Job adverts/vacancy descriptions
- Industry professional bodies.

This resource is part of a set of brochures focused on subject majors; many can also be studied as minors.





Career and study information continued

UC students can choose to complete a minor alongside Computer Engineering in Communications and Network Engineering.

For more information, visit:

📄 www.canterbury.ac.nz/study/academic-study/subjects/computer-engineering

What skills can graduates gain?

Through studying a degree in Computer Engineering, graduates develop a valuable set of skills and competencies that can include:

- Understanding of computer hardware
- Designing programs, writing code and testing software
- Applying engineering and scientific knowledge in real-world situations
- Technological understanding
- Problem solving
- Analytical, logical and quantitative thinking
- Creativity and innovation
- Planning and organisation
- Communication and teamwork.

Applied learning

Students undertake 800 hours of work experience as part of this engineering degree, providing them with a good understanding of the industry and the confidence to apply their skills in a workplace setting. This experience can deepen students' skillset, awareness of others, working knowledge and employability.

What do employers look for?

Many employers look for generic skills such as communication, client/customer-focus, bicultural competence, cultural awareness, teamwork and initiative.

With technology, globalisation, and other drivers changing society, skills such as resilience, problem solving, and adaptability are important.

Skills that are likely to grow in importance include analytical and creative thinking, systems thinking and technological literacy.*

*World Economic Forum: www.weforum.org/agenda/2023/05/future-of-jobs-2023-skills

How can these skills be developed?

- Some skills are gained through studying
- Extra-curricular activities can help, such as getting involved in clubs, mentoring, cultural groups, part-time work or volunteering
- Be open to professional and personal development opportunities, whether it is undertaking work experience, overseas exchange, skills seminar, or joining an industry group.

Where have graduates been employed?

Computer Engineering graduates are able to develop dedicated hardware and industrial software. The range of industries in which computer engineers are found is extensive. There are plenty of exciting job opportunities locally, nationally and internationally.

Graduates have found employment in both public and private sectors, including:

- Government
- Manufacturing
- Telecommunications
- Transportation
- Healthcare
- Data science.

Many find employment with companies who create smart devices, such as:

- IT companies e.g. Tait Communications, InterGen, Wētā
- Internet giants e.g. Google, Amazon
- Smart technologies and network companies e.g. Allied Telesis Labs, Silver Peak Systems
- Banks e.g. Kiwibank
- App developers e.g. Smudge Apps
- Technology companies e.g. ABB
- Software companies e.g. ARANZ Geo
- Electronics manufacturers e.g. Toyota Tsusho Electronics, Dynamic Controls
- Energy companies e.g. Cortexo
- Medical innovators e.g. ARANZ Medical, Fisher & Paykel Healthcare
- Aerospace companies e.g. Blackhawk Tracking Systems, Verizon Connect, Rocket Lab.

What jobs and activities might graduates do?

Graduates with this degree are employed in a range of jobs — see some examples below.

Note: This list is not exhaustive, and some jobs may require further study, training or experience. It is recommended to start with the section 'How can I gain a sense of career direction?'

Computer systems engineer

- Design complex system based on computers
- Research and develop hardware and software modules for products e.g. telecommunications systems, machine intelligence devices, healthcare products

Embedded systems engineer, firmware engineer

- Create and program embedded software (firmware) in embedded smart devices
- Assist in manufacturing and design
- Work on debugging and testing firmware

Hardware engineer

- Design the physical components of computer systems
- Research and test hardware components
- Consider the costs of hardware to end users

Software engineer

- Analyse customer needs, evaluate computer software and research new technologies
- Identify solutions and develop software programs for new products
- Manage software development projects

Systems developer

- Work with both hardware and software systems to analyse and resolve system faults
- Design and write diagnostic programs, operating systems and software
- Troubleshoot inefficiencies and enhance system security

Design engineer, junior design engineer

- Use software/technology to develop new ideas
- Design and test prototype components
- Liaise with suppliers and manufacturers
- Oversee quality control

Software developer

- Identify requirements and write programs
- Test and make sure programs and systems are working
- Develop, maintain and upgrade programs in collaboration with other professionals such as designers

Test analyst, validation tester

- Design and develop tests for computer software and systems to detect problems
- Identify defects and bugs, and suggest fixes
- Record issues and track solution results

Mobile application developer

- Research the user market, and work with clients to meet their needs
- Build and test mobile applications
- Use coding techniques and software

Telecommunications and network engineer

- Design and maintain telecommunications equipment and systems
- Supervise the installation and use of equipment
- Provide training to staff after installation

Examples of other job titles and careers include:

- Security engineer
- Firmware engineer
- Platform test engineer
- Innovation engineer
- Product development engineer
- Research engineer.

Further study options

Various postgraduate study programmes can be pursued, including options in Rocketry, Signal Processing, Machine Learning, Communications, Computer Science, and Human Interface Technology. Advanced study can lead to an academic career in teaching and research.

Further study may facilitate career benefits such as specialist skills, entry into a specific occupation, higher starting salary, faster progression rate, and advanced research capability.

It is important to determine which, if any, further study options align with future career aspirations.

For further UC study options visit:

www.canterbury.ac.nz/study/academic-study

How can I gain a sense of career direction?

Understanding yourself and others is important to gain a sense of direction. This grows with experience; therefore, trying new things and reflecting on an ongoing basis is important.

Career planning checklist

Discover and reflect on:

- Your values, interests, strengths, abilities, and aspirations
- Your connection to whānau, people, and places
- Lifestyle preferences and location
- The skills you want to gain, use, or enhance

Engage in a variety of experiences to learn about:

- How you want to contribute to society, the environment, and global challenges
- The tasks, responsibilities and work environments you prefer
- Your work values, priorities and interests

Learn more and gather career and study information

(refer to page one of this resource)

- Speak with people working in careers that interest you; check the realities of a job/career
- Gather information from various sources

Identify your next steps

- Talking to a career consultant can help you to identify your next steps. Visit: www.canterbury.ac.nz/life/jobs-and-careers



What have other students and graduates done?

Explore career stories of students' university experiences and UC alumni who make a difference globally in varied ways.

Visit: www.canterbury.ac.nz/about-uc/why-uc/our-students/student-stories



Xiaohan (Sasha)

Design Engineer, Tait Communications
Master of Science in Computer Science
Bachelor of Engineering with First Class Honours in Computer Engineering

What motivated you to study Computer Engineering?

I took a STAR computer programming course when I was in Year 12 and was fascinated by the wide range of applications for computer programs. I decided to learn more about computers and was told that computer engineering involves both hardware and software. I really wanted to know all of them so I chose Computer Engineering.

How did your degree prepare you for the future?

Being a Computer Engineering student, I've taken courses from Electrical and Electronic Engineering and Computer Science. The courses not only provide knowledge that the student needs to be familiar with but also many opportunities to practically apply the theory. The projects involved in the courses widened my knowledge in the area. I've learned systematic ways of solving engineering problems which did not limit my creativity to the solutions but helped me to think in the right direction.

What did your postgraduate project involve?

My master's project was about improving the wireless communication process for bus finders – the blue device at bus stops that display the minutes till the arrival of a bus – so they can be more energy-saving and reliable.

I worked on my project at the Wireless Research Centre which provides students with opportunities to work on industry-focused problems with the co-supervision of UC academics. I went on to work for them as a research engineer. This is typical of the way the Centre makes connections between industry and the broader university pool of expertise.

What advice would you give?

Be prepared to develop your perseverance during the course of your study. I don't think intelligence is a prerequisite for doing an engineering degree, but determination in achieving your goal definitely is.

If you are interested in technology and want to be someone that contributes to the innovation of technology in the future, UC Engineering is a good platform for you to develop all the necessary skills.

Career guidance

Career services are available for future and current students, and recent graduates. To learn more, contact:

Te Rōpū Rapuara | Careers
T: +64 3 369 0303
E: careers@canterbury.ac.nz
www.canterbury.ac.nz/life/jobs-and-careers

Helpful career insights

- Speaking with employers is key to finding opportunities; not all jobs are advertised
- Developing an online presence is useful as employers can search for future employees online
- Learning about recruitment patterns and where to find opportunities is important.

Study advice

Student Advisors at UC help with questions focused on starting, planning and changing studies. To connect with Student Advisors, visit:
www.canterbury.ac.nz/study/study-support-info/study-support

Future students – contact:

The Future Students team
T: 0800 VARSITY (0800 827 748)
E: futurestudents@canterbury.ac.nz

First year students – contact:

Kaitoko | First Year Student Advisors
T: +64 3 369 0409
E: firstyearadvice@canterbury.ac.nz

Continuing students – contact:

Pūhanga | Faculty of Engineering
T: +64 3 369 1717
E: engdegreeadvice@canterbury.ac.nz
www.canterbury.ac.nz/study/academic-study/engineering

