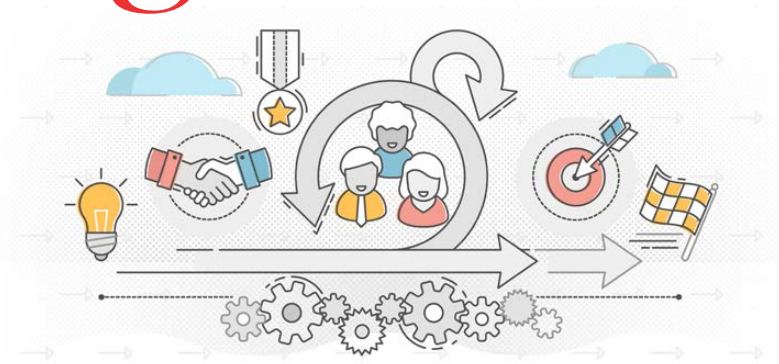
What can I do with a degree in
Software Engineering?

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Software Engineering.



What is Software Engineering?

Software engineering is about providing solutions to everyday problems in domains such as transportation, health, government, aerospace, agriculture, education or finance.

Software solutions may consist of millions of lines of code and integrate parts from external providers. This kind of complexity requires large teams to work together to deliver high quality solutions that are fast, reliable, secure and user friendly. Therefore, on top of programming, software engineers look after the design, accessibility and quality of software.

Software Engineers ensure a software product is developed using the right method and the right people! They do this by putting a team together that can transform users' expectations into a software that meets economic, ethical, technical and legal requirements.

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

- Engineering New Zealand
  💻 www.engineeringnz.org
- IT Professionals New Zealand
  💻 www.itp.nz
- Software Innovation New Zealand
  💻 www.softwareinnovation.nz
- Association for Computing Machinery
  💻 www.acm.org

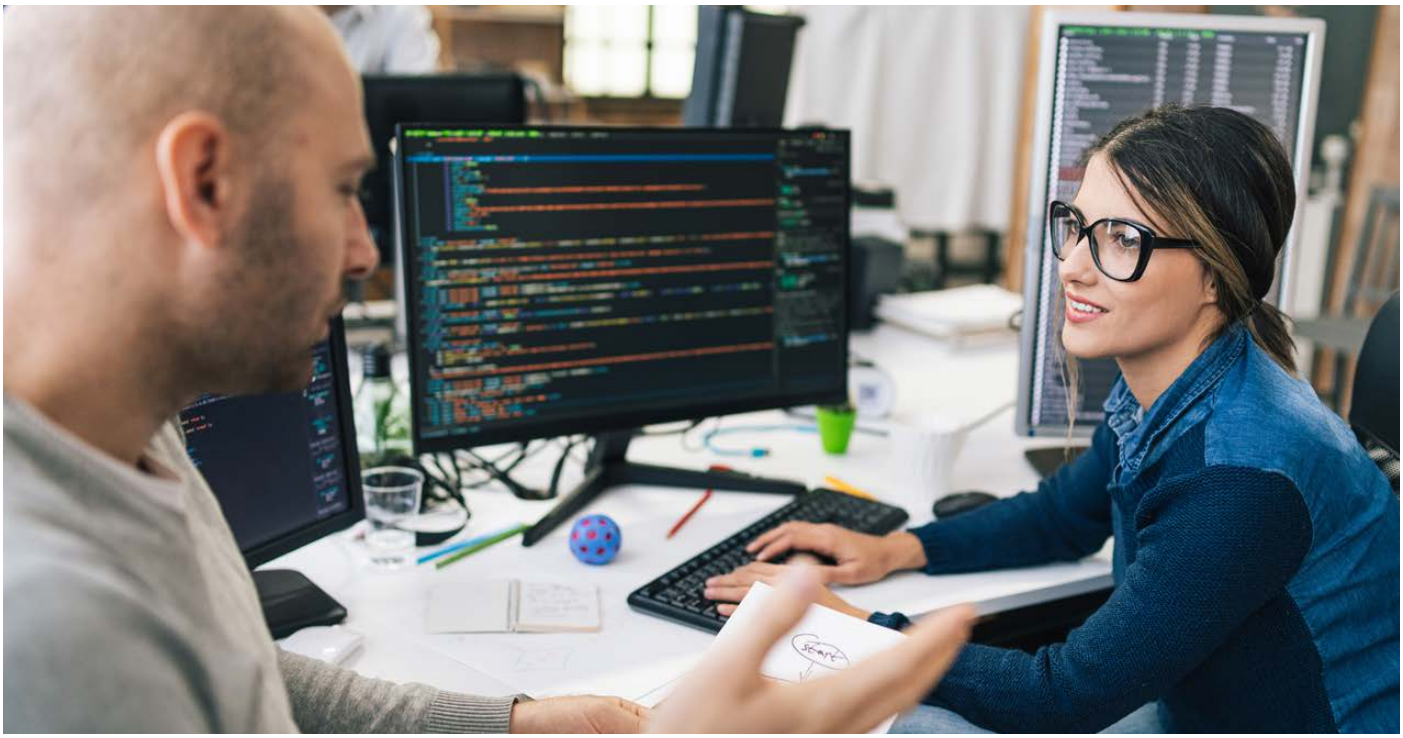
Career and study information

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

Should I study Computer Science or Software Engineering?

These related disciplines both provide technical training in various aspects of computation but with different emphases. Software Engineering focuses on practical and human aspects of software development and management of teams.

In contrast, Computer Science provides a broader exploration into areas of fundamental research, as well as links between computation, the sciences and arts.

What skills can graduates gain?

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

- Technical knowledge (e.g. security, artificial intelligence, human-computer interaction)
- Collect, analyse, document, and manage the needs and expectations of stakeholders
- Understanding the social impact of technology
- Development processes
- Problem analysis and solving
- Quality and risk assessment
- Programming and design
- Teamwork and communication
- Creativity and innovation
- Adaptation to technological changes.

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.

These experiences 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, and active and project-based learning
- 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?

There has been an ongoing demand in Aotearoa New Zealand for IT related professionals. Graduates have found employment across a range of organisations and industries, including:

- Aerospace and aviation
- Automation, autonomous and embedded devices, and heavy industries
- Education, healthcare and energy sectors
- Electronics manufacturers
- Energy companies
- Financial and legal services
- Grocery, e-commerce or retail
- Government or state-owned enterprises
- Media, entertainment and marketing
- Mobile app and game development
- Software development and services
- Telecommunications, networking and geolocation
- Web and cloud solutions.

Former students have also gone on to start their own companies e.g. Komodo Monitr, Lab3 or Vxt.

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?'

Software engineer (or full-stack developer)

- Focus on the business-side of (web-based) software solutions
- Transform customer expectations to high quality programs
- Build prototypes to demonstrate the feasibility or economic viability of new software
- Test and maintain existing software

Web / mobile developer (or front-end developer)

- Design usable screens to capture or present information
- Work on accessibility problems i.e. how to make software systems usable by visually impaired or elderly persons

Infrastructure and security engineer

- Look after the infrastructure aspects of IT systems
- Design, deploy and maintain the computing machines, network devices and security procedures
- Monitor in real time the state of a network

Software tester

- Develop strategies and plan to test software extensively
- Work with security engineer to improve software reliability and resilience

Software architect

- Make technical and strategic decisions for complex software systems
- Ensure high quality standards are followed for software development
- Collaborate with cross-functional teams to solve technical challenges

Business intelligence and analyst

- Use mathematical and analysis skills to make sense of lots of data
- Help organisations make informed decisions regarding infrastructure or marketing aspects of software systems

IT consultant

- Solve complex or highly specialised problems on a fixed-time basis in other companies
- Estimate the cost of implementing a particular technical or business solution

Project manager, scrum master

- Coordinate a team of developers that work on a software product
- Ensure the work done is of high quality and meets customers' needs
- Look after all members of a team

Game developer

- Develop (successive versions of) a game from story boards
- Work on various aspects of game development such as the graphics or engine (environment)
- Use cutting edge technologies and methods to develop, test and roll out games

Examples of other job titles and careers include:

- Machine learning engineer
- Computer vision engineer
- Data scientist
- Platform engineer
- Security engineer
- Software developer / design engineer
- Product development engineer
- Support analyst
- Systems programmer
- Technical consultant.

Further study options

Software Engineering graduates are able to progress their studies to Masters in Engineering, Masters in Science, and PhD in Computer Science.

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

Jake

Sarah

Jake

Co-Founder and Director, Lab3 Limited

Bachelor of Engineering with Honours in Software Engineering

Why did you choose Software Engineering?

I think the freedom of software is what appealed most, there is an unlimited number of things you can build if you apply a bit of problem solving.

What helped you transition into work?

The practical work requirement of the Engineering degree was a key part in showing me what to expect from my choice of study once I made it into the industry. It was a great way to try out my skills in a low-risk situation where your superiors are helping you to get the most out of learning on the job and succeeding.

Throughout the course we were taught not only practical software skills, but a whole range of subject matter crucial to being an effective engineer. We were taught things like basic principles of law, financial management, ethics, and project management. All of it has proved useful in some way with what we're doing at Lab3.

What is it like working for yourself?

With Lab3, I'm able to apply all the skills learnt in my degree directly to real-world problems. We're in a really fortunate position where we have the freedom to work with a massive range of tools and software engineering practices for a whole range of different use cases.

Sarah

Software Engineer at Trimble Inc.

Bachelor of Engineering with Honours in Software Engineering

How did your subject choice come about?

I was enrolled in Civil Engineering when I took an elective paper in programming. I didn't really know what coding was, but I found it fascinating! That led me to changing my whole degree to Software Engineering instead.

What was your favourite part of your degree?

The fact that there's more than one way to get things done! Software engineering is so open to the imagination. As technology advances, things are getting better and faster, and new solutions are always coming up. It's a constantly changing field.

Did you find your studies relevant in a real job setting? Absolutely. My studies have taught me a way of thinking – how to approach a problem and different ways you can tackle it. It's something you can always draw on no matter how the industry evolves.

Were you apart of any clubs?

Yes, I was vice president of WITSoc, the Women in Tech Society. Women are a minority in tech, so it's great to have a club that provides us with support and social opportunities. We threw a free coffee time every week, host cocktail events and also run seminars on CV building and interview skills. It's about building connections with each other, and industry.

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

UC UNIVERSITY OF CANTERBURY | Te Rōpū Rapuara Careers

Career profiles and the information in this brochure were correct at the time of creation but are subject to change.