

What can I do with a degree in Civil Engineering?

Civil Engineering.



What is Civil Engineering?

Civil engineering focuses on the design, construction, and maintenance of various types of infrastructure projects that are essential for modern society. It can involve public, private or commercial projects.

Civil engineers are kaitiaki (stewards) of nature, innovators, collaborators, and risk managers who plan, design, and improve structures and facilities, like buildings, transportation systems, drinking water and wastewater systems to ensure they are safe and structurally sound.

Civil engineers address 21st-century challenges like climate change, pollution, waste, water supply, flood control, and the sustainable energy transition to build resilient communities and a sustainable world. They devise solutions to complex problems in collaboration with clients, professionals, and communities, including mana whenua.

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
- The Association of Consulting Engineers New Zealand Inc www.acenz.org.nz
- Structural Engineering Society New Zealand
www.sesoc.org.nz
- New Zealand Society for Earthquake Engineering www.nzsee.org.nz
- Engineering Associates Registration Board NZ
www.engineering-associates.org.nz
- Engineers for Social Responsibility
www.esr.org.nz

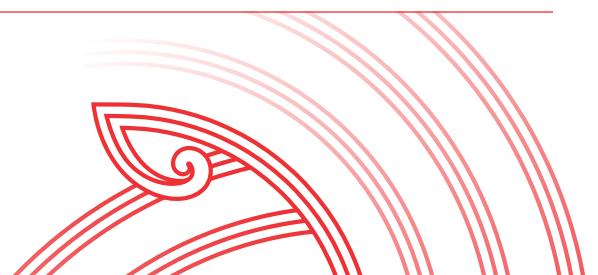
Career and study information

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 Civil Engineering in either:

- Structural Engineering
- Water and Environmental Systems Engineering

For more information, visit:

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

What skills can graduates gain?

Through studying a degree in Civil Engineering, graduates develop a valuable set of skills that are transferable to a range of careers within and outside of engineering. These skills can include:

- Practical application of engineering technology and science
- Design skills and an understanding of computer design software
- Awareness of environmental, ethical, cultural and legal considerations
- Analytical and critical thinking
- Logical and quantitative thinking
- Problem solving and decision making
- Creativity and innovation
- Communication and teamwork
- Supervising, directing and organising people and projects
- Time-management, planning and organisation
- Creating solutions for a sustainable future.

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?

Civil engineering graduates work for various types of employers given the diverse nature of the field. New graduates have found employment with:

- Professional engineering consultancies
- Engineering contractors
- Government bodies
- Primary industry companies
- Research institutes
- Architectural practices
- Transport and road surfacing firms
- Environmental contracting organisations
- Oil and utility companies.

Civil engineers may specialise in sustainable engineering areas such as:

- Pollution management and treatment
- Water resources and irrigation
- Renewable energy
- Land and water conservation
- Geotechnical engineering
- River catchment management
- Urban and community planning
- Public health engineering
- Waste management and recovery.

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?'

Civil engineer

- Consult with stakeholders on requirements
- Plan and design structures and systems
- Analyse the strength and capacity of structures and systems

Structural engineer

- Design and supervise the construction of structures
- Investigate and analyse the site conditions
- Refurbish and strengthen existing structures

Environmental engineer, ecological engineer, waste management expert

- Test environmental samples for pollution
- Minimise the project's environmental impact
- Design waste management systems

Water engineer, water resources engineer

- Design water-related systems e.g. pipe work
- Monitor the progress of water projects
- Check water-related systems for possible issues

Project engineer, project manager

- Manage a project plan, budget and schedule
- Supervise a project's daily progress
- Liaise with project staff and clients

Fire engineer

- Use modelling software to prepare reports, specifications and drawings
- Conduct forensic engineering for insurance/legal purposes
- Design and inspect safety systems

Geotechnical engineer

- Analyse the geologic data to identify important hazards and the likely future behaviour of the site when developed
- Determine an area's suitability for construction
- Make construction recommendations

Transportation engineer

- Design, test and improve transport systems and structures

- Create plans to meet changing transportation needs and population patterns
- Research and analyse traffic patterns

Site engineer

- Survey and level the building site
- Check accuracy of construction plans/materials
- Oversee the quality of building work

Humanitarian engineer

- Apply skills to help developing communities
- Develop resource solutions with local groups
- Problem solve in challenging environments

Bridge engineer

- Plan, design and model new bridge projects
- Oversee implementation progress
- Liaise with project staff and clients

Examples of other job titles and careers include:

- Civil and structural engineering: Infrastructure engineer, Land development engineer, Dam safety engineer, Stormwater engineer, Transmission line engineer
- Environmental engineering: Sustainability engineer, Natural resources engineer, Hydrotechnical engineer, Groundwater officer
- Transportation engineering: Road maintenance engineer, Traffic management coordinator
- Engineering management: Operations officer, Consultant, Business consultant, Consent planning consultant
- Other specialised engineering roles: Research engineering officer, Design engineer, Quality control engineer, Utilities site engineer
- Data analysis and modelling: Analyst, Analytical technician, BIM engineer, Hydraulic modeller, Estimator.

Further study options

Various further study options relating to Civil Engineering are available, from postgraduate certificates, and master's degrees to PhD. Some courses are run in block-mode, enabling participants to fit study around work commitments.

For further UC study options visit:
www.canterbury.ac.nz/pg-cnre

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.

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



Sebastian



Alyce

Sebastian

Structural Engineer Technician, Spanbild NZ
Bachelor of Engineering with Honours in Civil Engineering

What does your job involve as a Structural Engineer?

As this company focuses on producing engineering solutions for projects, I was tasked to calculate wind speed acting on structures for projects all around New Zealand. Besides that, I produced 3-D models for projects which required further specific adjustments and verified that they were in accordance with the standards. Working at Spanbild has allowed me to apply the knowledge I learned from UC to actual projects and buildings.

What did you enjoy about studying at UC?

The staff at UC are generally just welcoming and lovely. I received a warm welcome on the first day I arrived in Christchurch which is partly the reason why I settled in well during my first year here. My experiences at the University have helped me to realise that what I have been through back home in Kuching was just a small part of my life. I have never regretted my decision to be part of this eye-opening experience.

What are your career goals?

My goal is to work as a professional engineer with a focus on residential, commercial and industrial structures. I would like to see myself working in different parts of the world and learning different cultures' views on Civil Engineering. In the long run, I hope that my work experience can lead me to becoming a successful developer back in my hometown.

Alyce

Water Engineer, WSP
Board Member, Engineering NZ
Host, Māori in Engineering podcast
Bachelor Engineering with Honours
Diploma in Global Humanitarian Engineering

What do you enjoy about being a Water Engineer?

I mostly enjoy the idea of going to work every day and at the end of it, giving back to the community and the environment. In terms of being a water engineer specifically – it's quite an important time to be in the industry because of the water reforms, especially in Wellington where I'm based. Trying to figure out different and better ways of doing things, and navigating that process is something I really enjoy.

Why did you start the Māori in Engineering podcast?

I started this podcast because I thought it was important to create an accessible space to showcase awesome Māori doing awesome things in the engineering space. Every episode, there is the opportunity for someone to learn something different and another story told of Māori in the engineering space in the hope we do things better in the future.

Do you have any advice for new graduates?

It's okay to feel all the emotions – especially if it's not what you thought it was going to be. You don't have to be a changemaker straight away, sometimes things take time to progress or work out. Investing in relationships, both with yourself and elsewhere is also important. With that, it's also okay to ask for opportunities – no one is a mind reader and sometimes it's best to voice what you want.

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

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

