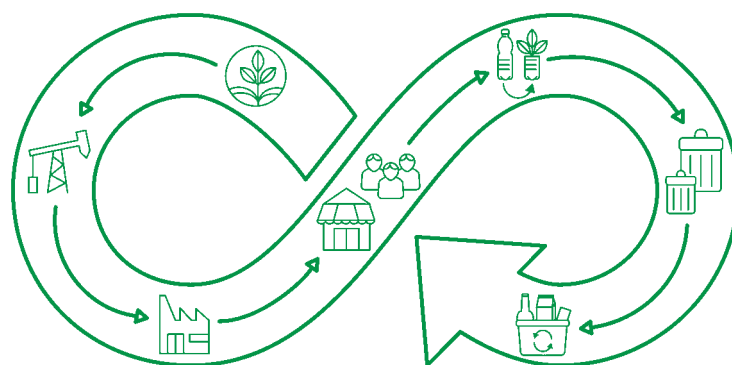


What can I do with a degree in Chemical and Process Engineering?

Chemical and Process Engineering.



What is Chemical and Process Engineering?

With a Chemical and Process Engineering degree you will be equipped to provide society's most fundamental needs, including:

- Supplying clean, safe drinking water
- Creating sustainable energy opportunities
- Improving society's health and well-being
- Providing a sustainable food supply.

Chemical and process engineers transform raw materials into products by chemical, physical or biological means. They design processes in facilities for processing oil and gas, metals, chemicals, fertilisers, wood, paper, food, medicines and more. They take science experiments from the laboratory and operate them at commercial scale to produce tangible goods for society.

Chemical and process engineers improve the sustainability of production, reduce energy and materials consumption, and ensure society has enough clean food and water to thrive.

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

- Institution of Chemical Engineers
www.icheme.org
- Engineering New Zealand
www.engineeringnz.org
- The Association of Consulting Engineers New Zealand Inc
www.acenz.org.nz
- AIChE (American Institute of Chemical Engineers) <https://www.aiche.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

UC students can choose to complete a minor alongside Chemical and Process Engineering in either:

- Bioprocess Engineering
- Environmental Process Engineering
- Sustainable Energy Engineering

For more information, visit:

📄 www.canterbury.ac.nz/study/academic-study/subjects/chemical-and-process-engineering

What skills can graduates gain?

Chemical and Process Engineering graduates develop technical knowledge about the processing of chemicals and other materials, and a valuable set of transferable skills. These skills can include:

- Application of engineering technology and science
- Ability to apply scientific fundamentals to practical problems
- Measuring and evaluating systems and processes
- Knowledge of chemical composition and processes
- Problem solving and decision making
- Logical and quantitative thinking
- Commercial and economic awareness
- Written and verbal communication
- Programming.

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?

Chemical and Process Engineers are found in organisations that make products or process materials, treat waste streams, optimise energy use, and increase efficiency and sustainability. Graduates have found roles in sectors such as:

- Professional, scientific, and technical consulting e.g. Beca, Harrison Grierson, Aurecon, Worley, Safety Solutions, Earth Systems, IVS Labs, Technix
- Food, beverage, pharmaceutical and packaging e.g. Goodman Fielder, Fonterra, Harrington's Breweries, Westland Milk Products, Wineworks, Heinz Watties, Tetra Pak
- Heavy industry e.g. Alcoa, Dow, NZ Aluminium Smelters, Golden Bay Cement, NZ Steel
- Electricity, gas, water and waste services e.g. Christchurch City Council, Transpower, Origin Energy, Powerco, Water Corporation
- Energy and mining e.g. Todd Energy, OceanaGold, Orica, Methanex, Renewable Energy Corporation, Petronas
- Agriculture, Forestry and Fishery e.g. Carter Holt Harvey, Forest Research Institute Malaysia, Ravensdown
- Construction and infrastructure e.g. Babbage Consultants, Rationale, Marley Pipelines, Mott MacDonald.

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?'

Chemical and process engineer

- Research and develop factory processes
- Examine the effects on the environment
- Prepare and present reports

Sustainability Engineer

- Optimise energy use
- Reduce waste and increase efficiency
- Protect the environment

Process control / improvement engineer

- Evaluate and optimise equipment
- Monitor materials, processes and surroundings for problems
- Document and record information

Field engineer / officer

- Install and maintain product and equipment
- Ensure safety of equipment
- Coordinate the workloads of staff

Research engineer

- Test materials, products and processes
- Write and present findings and reports
- Advise and consult with others

Pharmaceutical engineer

- Design and produce pharmaceutical products
- Conduct pharmaceutical research
- Assess the quality assurance of processing

Food engineer

- Develop techniques for processing, packaging and preserving food or beverage products
- Design manufacturing equipment
- Research and create new food or beverages

Project engineer, project manager

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

Energy engineer / consultant

- Test environmental samples for pollution
- Identify solutions and design systems/ machinery to meet energy-saving targets

Drilling engineer, well services engineer

- Monitor well operations and rig sites
- Develop drilling plans and programmes
- Adhere to environmental protection standards

Quality assurance technologist, quality analyst

- Ensure products and processes meet standards
- Develop company quality policies/procedures
- Reduce waste and increase efficiency

Application engineer / scientist

- Understand customer needs
- Participate in product development life cycle
- Provide applications support e.g. training

Examples of other job titles and careers include:

- Operations coordinator/manager
- Air quality / fire engineer
- Water / environmental engineer
- Maintenance engineer
- Algal biotechnologist
- Brewery technician
- Data processing technician
- Drafter / process control designer
- Process safety engineer
- Policy advisor
- Research and development engineer
- Support engineer
- Technical advisor
- Validations technologist
- Tutor / teaching assistant.

Further study options

UC offers postgraduate study in Chemical and Process Engineering up to PhD level, as well as conversion qualifications in subjects such as management, teaching and business. Advanced study can lead to an academic career in teaching and research, or leading industrial research departments.

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

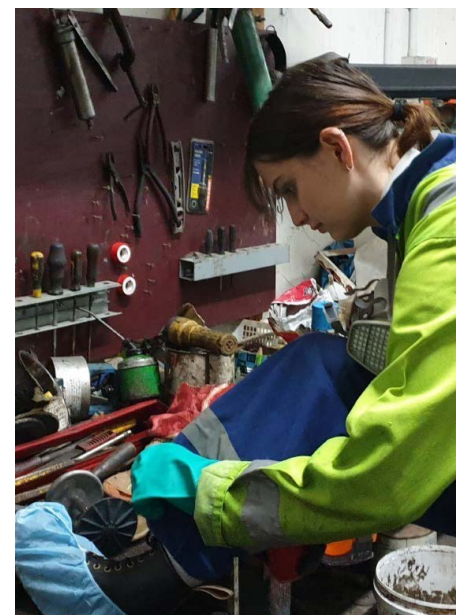
Learn more and gather career and study information

(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



Samantha

Process Engineer, Beca

Past experience: Summer Internship, Lincoln Agritech

Bachelor of Engineering Hons (Chemical and Process Engineering with Minor in Environmental Process Engineering), University of Canterbury

Bachelor of Science (Chemistry and Pharmacology), University of Otago

What does your job involve?

My role primarily involves wastewater and drinking water treatment plant design. We help improve the operation of these plants and design upgrades to ensure they stay compliant with new rules and regulations.

What do you find interesting about your work?

Every project that we work on is really different and involves so many different teams and disciplines. I have found it interesting learning how many different methods there are to treat water and learning about when and why you use these different treatment methods.

What motivated you to study Chemical and Process Engineering?

I began studying at the University of Otago where I completed a Bachelor of Science in Chemistry. I really enjoyed the theoretical and lab work within Chemistry, however I wanted a way to apply it to real world applications on a much larger scale. I became really interested in engineering, specifically Chemical Engineering because it allowed me to apply my chemistry knowledge to a larger scale where I felt I could make a real difference in my community.

When I found out about the 3+2 CAPE programme at UC I knew this would be a great opportunity for me. This pathway allowed me to take my knowledge from my Chemistry degree and apply it to engineering, without having to start again from first year.

What advice would you give to someone considering studying in your degree area?

The advice that I would give to someone considering studying a joint degree is to just do what you enjoy. If you choose the subjects that interest you, then you will end up working in a field that you love. The joint BSc and BE (Hons) gives a great pathway for anyone who is interested in both science and engineering. The joint pathway can be challenging, so make sure to make the most of all of the support that is offered to you at UC. I have found this pathway really valuable in keeping potential career paths wide after university and it gives you a unique set of skills which help you stand out from other graduates.

Do you have any career goals?

I would like to get chartered one day and potentially work overseas, as many overseas plants are a lot larger scale than we have in New Zealand.

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

