

What can I do with a degree in Chemical Formulation Design?

Chemical Formulation Design.



What is Chemical Formulation Design?

Chemical Formulation Design is the process of creating and optimizing the composition of a mixture of ingredients to deliver a specific function in a product. Formulated products play a crucial role in the creation of numerous items that are integral to our daily lives such as pharmaceuticals, cosmetics, food, beverages, household goods, agrochemicals and more.

Specialists in this field meticulously select and combine chemicals to ensure the product aligns with specific design and performance criteria, characteristics, quality and regulatory standards and possess a suitably long shelf-life.

Chemical Formulation Design intersects with disciplines such as science, product design, engineering, business, and marketing. Students delve into chemistry, biology, natural compounds, extraction methods, toxicology, improvement processes, research and development, production, quality assurance, and regulations.

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

- New Zealand Institute of Chemistry
<https://nzic.org.nz>
- New Zealand Society for Cosmetic Chemists
www.nzccc.org.nz
- Natural Health Products NZ
www.naturalhealthproducts.nz
- Ngā Aho Māori Design Professionals
www.ngaaho.maori.nz
- International Federation of Pharmaceutical Manufacturers and Associations
www.ifpma.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/study/academic-study/subjects/chemical-formulation-design
- 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.



What skills can graduates gain?

Chemical Formulation Design graduates develop skills in creative design, formulation science, and business and marketing to design and prototype products, and commercialise ideas for many industries. These skills can include:

- Understanding of the design process – from idea generation to commercialisation
- Technical understanding and hands-on experience in formulating a wide range of functional products
- Design of packaging, marketing and consumer perception studies
- Employment of design tools, including computer aided design (CAD) and graphic processing software
- Critical thinking and application of logic to proposed design solutions
- Creativity, problem solving, initiative and enterprise
- Self-management, resilience and adaptability
- Teamwork, collaboration, planning and organisation
- Oral and written presentations.

Applied learning

Applied learning opportunities are available such as practical team-based projects, entrepreneurship courses, and the use of dedicated product innovation spaces. These experiences deepen graduates' 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 Formulation Design graduates are positioned well for opportunities across many industries within Aotearoa New Zealand's innovative economy as well as in the global economy.

There are opportunities in a range of industries involved in producing, testing or research and development, such as:

- Agrochemical / agriculture e.g. KiwiCare
- Chemical / ingredients industry e.g. Brenntag
- Foodstuffs e.g. Fonterra
- Healthcare
- Household products
- Personal care and beauty products e.g. Earthwise, Abel Fragrance
- Pharmaceuticals.

Graduates may work in large companies as product formulation specialists or in small and medium enterprises (SMEs) that typically benefit from 'all-rounder employees', who can offer not only technical and scientific skills but also marketing, consumer behaviour, and management knowledge.

Some graduates may start up their own businesses from ideas for new product lines they have developed during their studies.

What jobs and activities might graduates do?

Chemical Formulation Design studies may lead to a career in product formulation and manufacturing or more broadly into any industry that employs graduates with a scientific background and creative mentality – 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?'

Product development scientist

- Research a client's brief, an organisational or social need, or a gap in the market
- Design and develop prototype sample formulations within budget
- Commercialise products through trials, industry submissions and production runs
- Improve existing products and comply with quality standards and industry regulations

Quality manager, quality control technician

- Ensure that products, processes and systems meet quality and regulatory standards
- Develop policies and procedures
- Solve problems, make decisions and support others to achieve these standards

Laboratory technician

- Test raw materials and evaluate results
- Analyse finished products and keep records for quality management purposes
- Maintain lab supplies, equipment, chemicals

Product / manufacturing manager

- Manage a specific product or line of products that are already in the market
- Coordinate production of approved prototype
- Oversee operations and logistics
- Handle product enquiries, complaints, orders

Marketing analyst, portfolio analyst, business development manager

- Conduct market research into product usage and audience preferences
- Analyse performance of existing products or identify new requirements
- Prepare business cases for product changes
- Market the products, develop new business opportunities and increase sales

Formulation scientist

- Develop and optimise chemical formulations for various products such as cosmetics, pharmaceuticals, adhesives, coatings, and personal care products

Principal / senior formulation scientist

- Lead business initiatives on new products, and manage budgets
- Manage formulation development staff
- Lead the formulation and manufacturing processes

Research scientist

- Conduct research to develop new materials, improve processes, or solve technical problems related to formulation chemistry
- Design experiments, analyse data, and collaborate to develop and improve products

Examples of other job titles and careers include:

- Chemist
- Research and design cosmetic chemist.

Further study options

UC offers a range of higher qualifications through the School of Product Design.

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



Sarah



Brianne

Sarah

Ngāpuhi
Bachelor of Product Design

Product design and chemical formulation – wow, tell us about that?!

We develop all aspects of a product, from the formulation itself to the packaging, the way it's transported, how eco-friendly it is and how we would market it.

What inspired you to go into that?

One of my brothers is in engineering at UC and I was going to follow him into that. But a high school teacher told me about this degree and how it blends art, science and business. She said she thought I'd really enjoy it and she was right!

Tell us about Koa, the product you created.

In second semester we had to create a soap. My initial thought was to do something with used coffee grounds which are good for sensitive skin. I also wanted to include Rongoā Māori, our traditional recipes, so I added kawakawa oil which helps with healing. I named my product Koa, which means "joy". The whole kaupapa behind the product is about healing and spreading joy. Sounds amazing!

One day I'd like to start my own business that's centred on Rongoā Māori, using old recipes for medicinal balms and stripping it right back to the basics.

Brianne

Founder & Director, Ethique
Bachelor of Science in Biological Sciences

Where did you come up with your business idea?

I was studying Biochemistry at UC at the time actually. I dropped my shampoo bottle on the floor in the shower and, as usual, about half of it spilled everywhere and I thought 'this is madness'. Why put water in shampoo when there's already water in your shower? Why contribute to the devastating effects of plastic bottles when you don't have to? So I decided to make a solid shampoo bar that lathers in the shower.

How did you attract funding?

I attracted an initial investor through a pitching competition run by UC. I then secured \$200,000 in 2015 through a crowdfunding campaign run by the New Zealand company PledgeMe, attracting the highest number of female investors in PledgeMe's history. We now have over 30 different products.

What motivates you in business?

I love science and the environment. I am passionate about the values Ethique stands for and the change we are creating in the world with products that are waste free, natural and effective. I am insanely proud that we have prevented more than 150,000 bottles from being made and disposed of thus far and our next goal is one million. I have been able to use the skills I have to create a business that has a positive tangible effect on the environment and that feels amazing.

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:

School of Product Design

T: +64 3 369 0299

E: productdesign@canterbury.ac.nz

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

