

CAREERS WITH STEM™ JOB KIT



CHEMICAL PRODUCT ENGINEER

Design and develop innovative products
to meet customer needs

SUPPORTED BY



UNSW
SYDNEY

UNSW Engineering

School of Chemical Engineering



UNSW
SYDNEY

INVENTING THE PRODUCTS OF TOMORROW

Chemical product engineers use their skills and knowledge to make real products that change real lives



PATRICK SPICER
ASSOCIATE PROFESSOR,
SCHOOL OF CHEMICAL ENGINEERING
UNSW SYDNEY

Chemical product engineering is where creativity meets science. It's about taking a bright idea – think smarter materials, cleaner cosmetics or more effective medicines – and turning it into something real that people can use every day.

What makes this degree really stand out is the freedom to innovate. You'll combine chemistry, design and engineering to create products that solve real-world problems, from sustainable packaging to lifesaving pharmaceuticals and next-gen food tech. It's hands-on, creative and focused on making science useful for people and the planet.

Chemical Product Engineers think about how materials perform in the real world – how they interact with our bodies, our clothes, our homes and the environment. Their work drives entire industries, powering economies and improving quality of life as they develop everyday consumer goods, breakthrough medical technologies, and everything in between.

Real-world experience, real-world impact

The Bachelor of Engineering (Honours) (Chemical Product Engineering) at UNSW is one of the only programs in the world where students invent and refine new chemical-based products before they graduate. You'll learn how to turn ideas into prototypes, test them with real consumers, and understand how performance, sustainability, and market needs come together. Along the way, you'll be mentored by leading researchers and industry

experts who've taken their own ideas from lab bench to global success.

Graduates go on to work in start-ups, design labs and international companies, developing everything from biodegradable materials and advanced healthcare products to greener technologies and consumer innovations that make everyday life better. Some even start their own ventures while at uni, using their entrepreneurial drive to leverage all the knowledge and connections they are developing.

If you love solving hard problems but also want to think creatively and make a visible impact, Chemical Product Engineering gives you the tools to do both. It's about turning chemistry into something you can hold in your hand, and using it to build a better world.

Patrick Spicer
Associate Professor,
School of Chemical Engineering
UNSW Sydney

YOU'LL COMBINE CHEMISTRY, DESIGN AND ENGINEERING TO CREATE PRODUCTS THAT CONNECT WITH THE WORLD'S CONSUMERS AND SOLVE REAL-WORLD PROBLEMS."

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING,
UNIVERSITY OF DELAWARE

TECHNICAL SECTION HEAD,
PROCTER + GAMBLE COMPANY

PHD IN CHEMICAL ENGINEERING,
UNIVERSITY OF CINCINNATI

ASSOCIATE PROFESSOR OF CHEMICAL ENGINEERING,
UNIVERSITY OF NEW SOUTH WALES

TECHNOLOGY LEADER,
PROCTER + GAMBLE COMPANY

Check out [CareerswithSTEM.com](https://careerswithstem.com) for more insights, information, inspiration and advice about careers in chemical product engineering!

Engineered to Create

Chemical product engineers don't just analyse materials – they invent them!

WHERE COULD YOU WORK?

BIG-NAME CONSUMER BRANDS

Think companies like Unilever (makers of Lynx, Dove, Surf) or Pental (White King, Softly). These teams need product engineers to help create and improve the household items on Aussie shelves.

FOOD + DRINK COMPANIES

Ever wondered who figures out how to make chips crispier or oat milk creamier? Engineers at food companies like Nestlé, Sanitarium (Weet-Bix!), and Goodman Fielder help bring food products from concept to kitchen table.

HEALTH + BIOTECH

Work on vitamins, skincare or even vaccines with companies including CSL (a global biotech giant based in Australia) and Blackmores (natural health products).

GREEN INNOVATION + PACKAGING

Help tackle waste and climate challenges with roles at Visy (recycling and sustainable packaging), Planet Protector packaging, or plenty of other companies rethinking materials for a greener future.

STARTUPS + LABS

Love inventing? You could be prototyping new materials, testing formulas, or even launching your own product at a startup, uni lab, or innovation hub like Cicada Innovations or UNSW Founders.

Think engineers just build bridges and solve equations? Think again. Chemical product engineers are behind the clever chemistry in the products we use every day.

This branch of chemical engineering is all about designing and developing new chemical-based products that are safer, smarter, more sustainable and more inclusive. And it's not just technical know-how that gets the job done. Chemical product engineers need curiosity, creativity and consumer thinking to transform a cool concept into something that works, lasts and sells.

With opportunities across cosmetics, biotech, food, clean energy and more, this is a career for creative engineers who don't want to sit still.

SKILLS CHECKLIST

Love science and creative problem solving? You could be a future chemical product engineer! Here are just some of the skills that come in handy in this career.

✓ You're curious, especially about how things are made.

✓ You like the idea of combining science with creativity.

✓ You enjoy getting hands on and solving real-world problems.

✓ You care about sustainability and making things better for people and the planet.

✓ You like working in teams to bounce around ideas and test things out.

✓ You're good at the details, and notice when things don't quite work like they should.

✓ You're into science and maths – but don't necessarily want to sit behind a desk all day.

Let's talk money

Chemical engineers (including chemical product engineers)

usually earn between **\$60,000 and \$137,000** depending on their skills and experience.

(payscale.com)

QUIZ YOURSELF!

Answer these 4 quick questions to find out where you might shine in chemical product engineering.

1. What excites you most about science?

- A. Solving complex problems and improving systems
- B. Creating new materials or products that don't exist yet
- C. Making sustainable choices that help the environment
- D. Understanding how things work on a microscopic level

2. Where would you most like to work?

- A. In a buzzing factory or processing plant
- B. In a lab developing the next big product
- C. On a team tackling climate change
- D. In the medical or pharmaceutical space

3. Which phrase best matches your vibe?

- A. "Fix it and make it better"
- B. "Let's invent it!"
- C. "Think green. Act smarter."
- D. "Science for health and humanity"

4. What's your super skill?

- A. Organisation and efficiency
- B. Big ideas and imagination
- C. Passion for the planet
- D. Curiosity and compassion

Simply the best

UNSW's engineering faculty consistently ranks as the best in Australia. You'll get hands-on experience, access to global research, industry placements and flexible double degree options.



RESULTS

Mostly As Process engineer

You're all about optimisation! You'd thrive in roles that improve how things are made – faster, safer, smarter.

Mostly Bs Product innovator

You're the ideas person. You'd love creating new materials, foods, cosmetics or tech-based products.

Mostly Cs Sustainability specialist

The planet needs you! You're likely to end up working on clean energy, circular economy projects or greener processes.

Mostly Ds Biomedical/pharma engineer

You're a health-focused helper. You'd suit roles creating life-changing medicines, materials or medical devices.



SCHOLARSHIPS TO WATCH

- MIKE BRUNGS SCHOLARSHIP FOR WOMEN IN CHEMICAL ENGINEERING
- UNSW ENGINEERING RURAL SCHOLARSHIP

FIND OUT MORE: AT [SCHOLARSHIPS.UNSW.EDU.AU](https://scholarships.unsw.edu.au) OR SCAN HERE

MAKING MOLECULES MATTER

ABDELRAHMAN ELATAWNA IS COMBINING CHEMISTRY AND CREATIVITY TO DESIGN EVERYDAY PRODUCTS THAT MAKE A DIFFERENCE

ABDELRAHMAN ELATAWNA
CHEMICAL PRODUCT ENGINEERING
STUDENT

Abdelrahman was always drawn to chemistry, but he wanted to apply that interest in a creative way. "I was interested in chemistry in high school but I also wanted the practicality of engineering," he says. "I looked into chemical engineering, but process design was not the most appealing to me. After some research, I found chemical product engineering, which offers the perfect combination of creativity and technicality."

What elements of the degree really won him over? "Its focus on designing end-user products, not just processes," he explains. "You're not just working with molecules – you're building something people will actually use."

That mix of technical know-how and design thinking is exactly what Abdelrahman has developed throughout his degree. He's explored everything from pharmaceuticals to advanced reaction engineering, shaped by electives that helped him understand different industries. "Discipline electives were an opportunity for me to shape my degree into one that supported my knowledge and understanding of the possible pathways I'd like to pursue," he says.

Brewing up innovation

The highlight of his UNSW degree has been the capstone project, where his team designed dissolvable tea sheets to eliminate microplastics and reduce waste in tea production. "We created the sheets by forming a thick syrup-like tea

resin and mixing it with natural additives already found in tea, then dehydrating the mixture to form a fully dissolvable tea sheet."

The experience taught him more than just chemistry. "The single most important lesson I have learned from my capstone is to not get attached to ideas. Bias could cloud your judgement and cause you to dismiss a better, more viable product."

Looking ahead, Abdelrahman hopes to work in product creation and development – whether that means leading innovation teams or launching his own product line.

His advice to future students? "Stay curious, and don't be afraid to ask questions. UNSW offers endless opportunities, so use them to not just build your career, but a future you are genuinely excited about."

YOU'RE NOT JUST WORKING WITH MOLECULES – YOU'RE BUILDING SOMETHING PEOPLE WILL ACTUALLY USE."

BACHELOR OF CHEMICAL PRODUCT ENGINEERING (HONOURS), UNSW

A day in the life of a... CHEMICAL PRODUCT ENGINEER

Elizabeth Paulino uses her engineering smarts to make sure everyday products reach shelves and homes

ELIZABETH PAULINO
PRODUCT SUPPLY MANAGER
PROCTER + GAMBLE



Elizabeth is a product supply manager at Procter & Gamble, one of the world's biggest consumer goods companies. She works behind the scenes making sure the things we use every day – from shampoo to cleaning products – are made to the highest quality and compliance standards and delivered to shelves and homes in Australia & New Zealand. She keeps an eye on the whole process, from sourcing ingredients to manufacturing to packaging and distribution. This amazingly complex system is known as the supply chain.

With a background in chemical product engineering and information systems from UNSW, she applies her skills in problem-solving, logistics and tech to help keep everything running smoothly.

"It's exciting to be part of the supply chain that brings innovations to life – seeing ideas and formulations evolve into real products that make a real difference for consumers," she says.

Her advice for future engineers? Keep an open mind about where your qualifications could take you!

"The skills you gain in chemical engineering – systems thinking, process optimisation and data analysis – are valuable across so many fields," she says.

Day in the life ...

8:30am

Begin the day by making sure customer orders are on track, ensuring full delivery, on time.

10:30am

Check in with retail partners to make sure everything's ready for a new product launch.

12:00 noon

Lunchtime!

1:00pm

Time to shift focus to big-picture planning. First, use fresh customer insights to help fine-tune sales predictions. With that info, it's time to optimise stockpiles across the supply chain.

3:00pm

Meet with the team and dig deep into the data to uncover new ways to make the supply chain more efficient and agile. This time, it's just a tweak, but sometimes the end-to-end product flow is totally redesigned to ensure products move seamlessly from factory to consumer.

**THE SKILLS YOU GAIN IN
CHEMICAL PRODUCT ENGINEERING ARE
VALUABLE ACROSS SO MANY FIELDS"**

BACHELOR OF CHEMICAL PRODUCT ENGINEERING (HONS) /
BACHELOR OF COMMERCE (INFORMATION SYSTEMS), UNSW SYDNEY

PROCESS ENGINEER,
SYDNEY WATER

SOLUTIONS ENGINEER,
SALESFORCE

WATER ENGINEER,
JACOBS

PRODUCT SUPPLY MANAGER,
PROCTER + GAMBLE

Get the job!

Your career in chemical product engineering starts here

CURIOUS ABOUT THIS CAREER? HERE'S HOW YOU CAN START BUILDING THE SKILLS AND MINDSET OF A CHEMICAL PRODUCT ENGINEER – RIGHT NOW.

1 Choose the right subjects

Pick high school subjects like Chemistry, Physics, Biology and Advanced Maths. These will give you a strong foundation in how materials behave, how reactions work, and how to approach problems like an engineer.

2 Make and test your own products

Try creating simple products at home – like soap, lip balm or a natural cleaning spray – and then think about how you could make improvements. (Always get a trusted adult to help and make sure you're using safe ingredients and methods!)

3 Join a science club or competition

Experiment with your ideas and meet like-minded peers by joining a STEM club at school or signing up to a science competition. It's a great way to get hands-on and build your confidence.

4 Watch Lab Muffin unpack the science behind beauty

Michelle Wong, a chemistry PhD, explains what's really going on in products like sunscreen, shampoo and skincare. Find her on YouTube or at www.labmuffin.com

5 Go behind the scenes at a real vaccine factory

Check out this exclusive look at how Pfizer makes the COVID-19 vaccine, and how they keep improving their production facilities in this short CNN documentary: <https://bit.ly/4pUfiWe>

6 Find out how shampoo is made by a chemical engineering professor

Learn how engineers think (and how your favourite hair products work) by watching "Shampoo: An Engineering Miracle" from the University of California, Santa Barbara. <https://bit.ly/44LrZuu>

7 Explore what's in your favourite products

Flip over the packaging of some of your most-used products at home and check the ingredients. What are they? Why are they there? Could they be replaced with something safer, simpler or more sustainable?



INSTA INSPO

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