


# SCHOOL OF CHEMICAL ENGINEERING


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**Future Student enquiries**  
[unsw.edu.au/ask](https://unsw.edu.au/ask)

**UNSW Chemical Engineering**  
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## How we change the world every day

The School of Chemical Engineering is focused on creating solutions for energy, food, and water sustainability that benefit both people and the planet. We drive excellence and bring new ideas to life by collaborating with students, educators, researchers, and industry partners. **By creating materials and building technologies that contribute to a sustainable and environmentally friendly future, we are playing a vital role in addressing some of the most pressing challenges of our time.** We invite future engineers in Australia to join our effort in advancing the fields of chemical engineering, food science, and product engineering and promoting sustainability. Together, we dedicate ourselves to making the world a better place and having a positive impact on future generations.

## Message from our Head of School



**Professor Cordelia Selomulya**

Head of School of  
Chemical Engineering,  
UNSW Sydney

The School of Chemical Engineering at UNSW Sydney is renowned for its excellence in education and research, with a distinguished legacy dating back to 1949. As one of the largest and most respected institutions in its field, we are at the forefront of shaping the future of chemical engineering in Australia and globally.

Chemical engineering plays a crucial role in addressing today's most pressing challenges. From creating sustainable products and systems and advancing clean energy technologies to improving water access and ensuring the safe production of vital goods like food and pharmaceuticals, our School leads the charge in innovation. With world-class research facilities and a dedicated team of academics, staff, and students, we are exceptionally placed to drive progress that benefits society.

Recognised both nationally and internationally, the School is home to prominent researchers who are pushing the boundaries of their fields. Our students collaborate closely with these experts, contributing to research that delivers real-world, impactful solutions. The achievements of our graduates continue to make significant contributions across industries, communities, and governments worldwide, cementing the reputation of our alumni as leaders and innovators in their fields.

As a diverse community of innovators and thought leaders, we are driving societal impacts through the transformative power of chemical engineering. Our academic programs, alongside robust industry partnerships, continue to foster a more sustainable and equitable future.

We are proud to lead the way. Join us in shaping the future.



### 1 Creating future leaders through world-class education

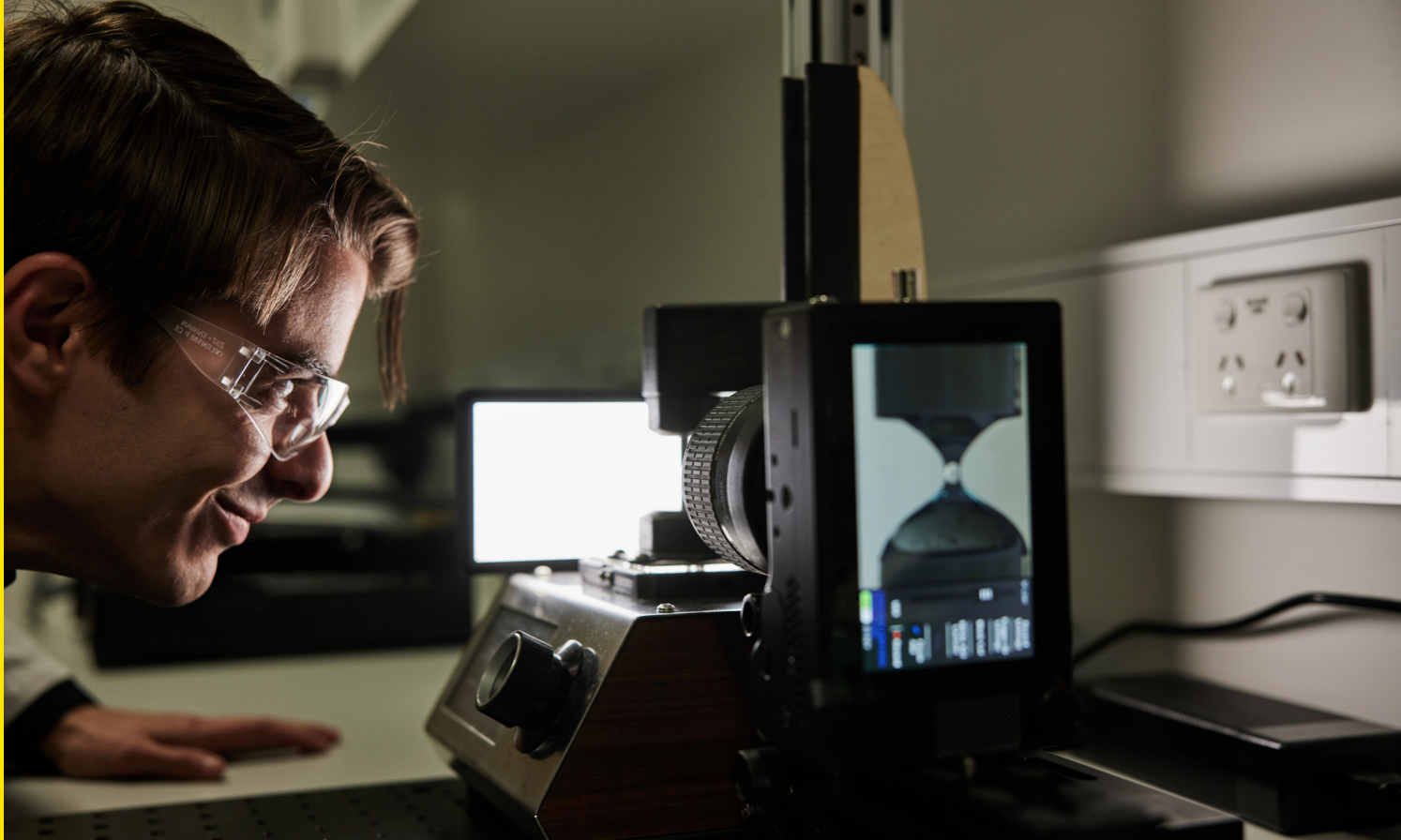
Prepare students to be part of a new generation of sustainable product and process engineering workforce.

### 2 Transforming industry with visionary research

Introducing research excellence frameworks for world-leading groundbreaking discoveries and technology translation.

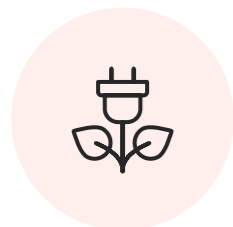
### 3 Accelerating progress for all with innovation and impact

Commercialising research to create more sustainable ways of living.



## Transforming industry with visionary research

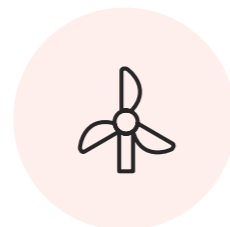
### Our research strengths



Clean Energy



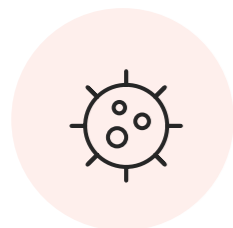
Engineering Targeted Medicine



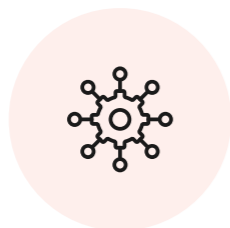
Environmental Processes & Technologies



Food Science and Engineering



Macromolecular and Interfacial Engineering



Nanomaterials and Nanotechnology



Smart Process Systems Engineering

## Creating future leaders and innovators

The critical need for development of innovative solutions to achieve sustainable product manufacturing has created an unprecedented demand for engineering graduates in the job market. This need for chemical engineers, often known as “the universal engineer”, both in Australia and internationally, means that **our students can make a positive impact in any industry and are often recruited well before finishing their studies.**

The UNSW School of Chemical Engineering helps students to understand and assess the various parameters (technical, economic, and environmental) needed to reimagine and improve the manufacturing of everyday products. **Our students learn to combine problem-solving with design-thinking** to develop chemical processes and equipment, optimise and control industrial operations, determine environmental effects and control pollution.

Many of our graduates rapidly evolve in a wide range of industries, including:

- > Bioremediation
- > Chemical manufacturing
- > Clean energy providers
- > Consulting
- > Education
- > Food and beverage production
- > Government, local authorities & large corporations
- > Minerals, petroleum and energy
- > Pharmaceutical
- > Research and development
- > Waste and water treatment and resource recovery

These represent just a few of the fields engineers can explore when tackling the world’s greatest challenges like climate change and decarbonisation of the industry.

## Degrees we offer

### Undergraduate

- > Bachelor of Food Science (Honours)
- > Bachelor of Engineering (Honours) in Chemical Engineering
- > Bachelor of Engineering (Honours) in Chemical Product Engineering
- > Bachelor of Engineering Science in Energy Engineering
- > Bachelor of Engineering Science in Food Engineering
- > Bachelor of Engineering Science in Water Process Engineering

### Postgraduate coursework

- > Master of Food Science
- > Graduate Diploma of Food Science
- > Master of Engineering Science (Chemical Engineering)
- > Master of Engineering Science (Food Process Engineering)
- > Graduate Diploma of Engineering Science (Chemical Engineering)
- > Graduate Diploma of Engineering Science (Food Process Engineering)
- > Graduate Certificate in Engineering Science (Chemical Engineering)
- > Graduate Certificate in Engineering Science (Food Process Engineering)
- > Graduate Certificate in Food Science

### Postgraduate Research Degrees

- > Doctor of Philosophy (PhD) in Chemical Engineering
- > Doctor of Philosophy (PhD) in Food Science and Technology
- > Master of Philosophy (MPhil) in Chemical Engineering
- > Master of Philosophy (MPhil) in Engineering Education
- > Master of Philosophy (MPhil) in Food Science and Technology
- > Master of Industrial Research (MIR) in Chemical Engineering
- > Master of Industrial Research (MIR) in Food Science and Technology

### Customised Professional Development Programs

We are able to bring together the brightest minds in research and industry to create bespoke development programs that are tailored to your goals.



## Research impact

Each year, our academics and research centres work with businesses, government, and community organisations on specific projects, transferring our research into practice. We continuously strive to make an impact that matters. Examples of the impact we make, include:

### Innovative, clean & green sustainable energy

The world is experiencing an energy revolution. As we move away from traditional fossil fuels that have powered us since the industrial revolution, our research enables the transition to a more sustainable, clean energy future.

**As a global leader in energy innovation, we're exploring ways energy is harnessed, stored, and used to feed our ever-growing energy needs.**

To date, we have developed many innovative technologies for affordable, clean and sustainable energy systems through novel and improved materials, systems development and optimisation as well as computational and data-driven modelling. These technologies include producing synthetic chemicals and clean fuels such as hydrogen, directly from sunlight, high-performance storage systems and generating biofuels from waste.

### Food Engineering

Our innovations in food engineering and processing include the development of advanced and sophisticated technologies for producing functional food ingredients and encapsulated powders, and thermal and non-thermal food processing.

We are at the forefront of advanced particle engineering and drying technology development, applying these technologies in the industry to produce powdered products **with improved quality and efficiency, at reduced costs and environmental impact.** This area of research is complemented by our expertise in micro-rheology in the detection of low yield stress in biological fluids. The technology is used for the analysis of bubble dynamics in complex fluids and to study bubble expansion and shrinkage. We are also developing practical tools for food rheology applications to understand the effects of processing on food structure.

With cutting-edge research in high-pressure, ultrasound, radiofrequency, and plasma technologies, **we develop innovative engineering solutions that enhance product quality and safety while reducing energy and water consumption.** These engineering and technological innovations enable preservation of heat-sensitive food products at low temperatures with enhanced organoleptic properties. Our interdisciplinary research in food engineering extends further to water detoxification, waste recovery and utilisation.

Our interdisciplinary team integrates molecular biochemistry, advanced material science and nanotechnology to engineer novel multifunctional and biocompatible materials for applications in bioactive delivery, and bio-catalysis. Our biomaterial research drives the creation of new generation functional bioplastics from sustainable resources, such as agricultural and food waste and/or by-products, with antimicrobial antioxidants and other biofunctions for application in active food packaging.

## World class facilities and capabilities

Our state-of-the-art Science and Engineering Building delivers a world-class research and teaching environment. **Our multifunctional building space provides purpose-built modern laboratories and collaborative learning spaces**

which include:

- > dedicated high-pressure facilities
- > high-intensity laboratory work
- > full capabilities of a wet chemistry lab and supporting infrastructure
- > chemical and biomolecular makerspace
- > three fully integrated bio-PC2 laboratories

The suite of facilities fully supports the School across its research clusters, centres and hubs, collaborative industry partnerships and across our undergraduate and postgraduate teaching.



## Our partners

The UNSW School of Chemical Engineering was set up with the industry in mind. Since we opened our doors over 70 years ago, **we developed strong, close links with industry.** These collaborations have been mutually beneficial, as we help them to better understand their needs now and in the future. We are also able to consult to industry on many levels from providing advice to embarking on co-operative research projects.

- > Allnex Industries
- > Atco Australia
- > Australian Nuclear Science and Technology Organisation
- > Arnott's
- > Commonwealth Scientific and Industrial Research Organisation
- > Ebusco Australia
- > Emirates Global Aluminium
- > First Pacific Capital Underwriters
- > Flame Security International
- > Fonterra
- > Honeywell
- > Hunternet Co-Operative Limited
- > Ironside Capital
- > Mitsubishi Chemical Corporation
- > N2N AI
- > Procter and Gamble
- > Technological Resources
- > Trimet Aluminium
- > Tooheys
- > Sanitarium Health Sunrice
- > Sydney Water
- > US Navy