Like other world’s best universities, UNSW sits at the heart of a sophisticated global knowledge system that is shaping our future. And UNSW Engineering – Australia’s #1 engineering faculty – is key to that effort.

We create positive social and economic impact through the best quality education and research. With more than 500 academics and researchers supported by 300 professional and technical staff, and expertise across nine schools and over 30 research centres – we are the powerhouse of engineering research and education in Australia. UNSW invests more than $100 million a year in engineering research. And we are internationally renowned for our innovations: from the world’s most efficient solar cells to quantum computing advances that are years ahead of everyone else.

In energy, water, biomedical implants (such as the bionic eye), cyber security, transport, sustainable mining, food science, chemical engineering and nanotechnology – the list goes on – we work at the cutting edge. It’s no wonder UNSW Engineering is rated in the top 50 globally across all three of the most respected rankings systems.

But it’s not just our research that makes an impact: it’s also the ideas and enthusiasm our graduates take into the world. For decades, our graduates have gone on to enrich, empower and inspire, and make our society the better for it. It’s no surprise that more of the top CEOs who lead Australia’s largest listed companies studied at UNSW than any other university.

At UNSW, our students are not only embedded within an environment creating the latest emerging technologies, they are also a part of that innovation. They learn from the best; not just technical knowledge and skills – but how to work in teams, how to think critically and how to innovate to solve open-ended problems. In doing so, they develop enquiring attitudes and cultivate the ability to ask the right questions.

We see our graduates and our research as the greatest contributions we can make to society. This is something we are determined to expand upon as part of UNSW’s 2025 Strategy, enhancing our global leadership in discovery, innovation, impact, education and thought leadership. At UNSW Engineering, we’re starting from a strong base – so the future can only get better.

Professor Mark Hoffman
Dean of Engineering
UNSW Engineers are making breakthroughs across some of the world’s biggest issues, from solar to quantum computing to technologies helping elderly people live at home for longer.

Spray-on solar cells

- They’re flexible, cheap to produce and simple to make – which is why perovskites are the hottest new material in solar cell design. And now, UNSW engineers have smashed the trendy new compound’s world efficiency record.

Anita Ho-Baillie, a Senior Research Fellow at the Australian Centre for Advanced Photovoltaics (ACAP) and her team at UNSW have achieved the highest efficiency rating with the largest perovskite solar cells to date.

The 12.1% efficiency rating was for a 16 cm² perovskite solar cell, the largest single perovskite photovoltaic cell certified with the highest energy conversion efficiency.

The new cell is at least 10 times bigger than the current certified high-efficiency perovskite solar cells on record.

“This is a very hot area of research, with many teams competing to advance photovoltaic design,” says Ho-Baillie, who is UNSW ‘born and bred’ having completed her Bachelor in Electrical Engineering through the UNSW Co-op scholarship program, and her PhD at UNSW.

“Perovskites came out of nowhere in 2009, with an efficiency rating of 3.8%, and have since grown in leaps and bounds. These results place UNSW amongst the best groups in the world producing state-of-the-art high performance perovskite solar cells. And I think we can get to 24% within a year or so.”

It is the fastest-advancing solar technology to date, and attractive because the compound is cheap to produce and simple to manufacture, and can even be sprayed onto surfaces.

“The versatility of solution deposition of perovskite makes it possible to spray-coat, print or paint on solar cells.”

Anita Ho-Baillie
Senior Research Fellow, School of Photovoltaics and Renewable Energy Engineering

learn more about our powerful research capabilities at: engineering.unsw.edu.au/news
With 32 research centres delivering world-class research and innovation, our work delivers global impact to solve some of the world’s biggest issues – we are world leaders in solar cell efficiency, quantum computing, robotics, and bionic vision. Our international reputation attracts high calibre researchers and considerable funding from research grants, Cooperative Research Centres and other public sectors, as well as industry donations.

UNSW Engineering is passionate about collaborating with researchers, teachers and industry around the world to ensure that we are creating positive impact.

### Dynamic staff

- **800+ staff**
- **500 academics**
- **300 professional and technical employees**

### Unveiling mysteries using virtual reality

- **Senior Lecturer** Seher Ata from Mining Engineering has created a virtual reality (VR) module offering students a fully interactive and immersive journey through the mysterious world of mineral processing.

In a world first, it is now possible to take an interactive journey into the fascinating belly of a base-metal concentrator.

Ata based the module on a real mineral processing plant at Northparkes Mine in NSW, where her team accumulated video footage and images to document every element of the plant, before having it animated to create an interactive 3D experience.

Undergraduate and postgraduate students have piloted the module and Ata was thrilled when many highlighted it as the best feature of the processing course.

"Because it’s so visual it helps students more deeply understand the connections between the steps. I have definitely seen the benefits in my teaching," she says. Ata believes the benefits of using VR in mining education will see its use continue to soar.

"VR is the only real alternative to field trips, which are great in theory but often impractical to organise being both time consuming and expensive," she continues. "I think we are only just realising how valuable virtual reality technology can be in the future of not only mining engineering but other engineering education too."
During my time at university I’ve contributed to a huge range of initiatives and gained so many invaluable experiences. But it’s been my involvement with the University’s Women in Engineering initiatives that I’ve enjoyed the most.”

Nisha Pradhan  BE (Electrical Engineering)
With UNSW Engineering recently ranked amongst the top five universities in Australia for graduate employability*, you don’t need to look hard to find our Engineering graduates impacting the way we live at home and around the globe. *Times Higher Education 2016 Global University Employability Survey

Dr Martha Lenio
PhD (Photovoltaics and Solar Energy Engineering)
- Dr Martha Lenio was the first female commander of a NASA-funded Mars mission simulation, spending eight months in the Hawaii Space Exploration Analog and Simulation (HI-SEAS) dome. Having graduated from UNSW with a PhD in Photovoltaics, her goal is to become a fully-fledged Canadian Space Agency astronaut and move one step closer to real Mars travel. The results that came from her crew’s research enabled NASA to extend the funding for three new missions.

Monique Alfris
BE (Photovoltaics and Solar Energy Engineering)
- Monique Alfris co-founded Pollinate Energy, an award-winning not-for-profit social enterprise that was established in 2012. The business provides access to affordable clean energy to improve the lives of people living in India’s urban slums by distributing technologies such as solar lights, stoves and water filters. Previously she worked to develop micro-financing in several Asian countries, and in a number of green building consultancy roles in Africa and Australia.

Sam Patterson
BE (Mechanical Engineering)
- A few months after graduating in 2014, Sam Patterson started at the electric car giant Tesla. When he first started, Paterson was working predominantly on battery module products, everything from battery modules going into Tesla’s Model X and Model S, to various sized battery packs, different cell chemistries and the modules going into the first generation of stationary storage. He is currently working on the high voltage battery pack for the upcoming Model 3.

Dr Hugh Chaffey-Millar
PhD (Chemical Engineering)
- Switzerland-based Dr Hugh Chaffey-Millar is Software Project Leader at healthcare giant Roche. Before starting at Roche in 2013, he worked at Med-El in Innsbruck, Austria, and TNG Technology Consulting in Munich, Germany, and conducted postdoctoral research in theoretical chemistry at the Technical University of Munich. The former Alexander von Humboldt Foundation fellowship winner is committed to making a difference through healthcare innovation.

Our graduates are highly valued and account for the highest number of Australian university alumni in the Most Innovative Engineers Awards, as determined by Engineers Australia 2016.
Extensive programs

We are proud to offer the most diverse degree options in Australia with the highest entry requirements in NSW across our nine engineering schools.

Undergraduate programs

Bachelor of Engineering (Honours)
+ Aerospace Engineering
+ Bioinformatics Engineering
+ Chemical Engineering
+ Civil Engineering
+ Civil Engineering with Architecture
+ Computer Engineering
+ Electrical Engineering
+ Environmental Engineering
+ Geospatial Engineering
+ Industrial Chemistry
+ Mechanical and Manufacturing Engineering
+ Mechanical Engineering
+ Mechatronic Engineering
+ Mining Engineering
+ Petroleum Engineering
+ Photovoltaics and Solar Energy Engineering
+ Renewable Energy Engineering
+ Software Engineering
+ Surveying
+ Telecommunications

Bachelor of Science (BSc)
+ Computer Science
+ Computer Science (Hons)
+ Food Science (Hons)

Degree combinations
Bachelor of Engineering (Hons) is offered in combination with:
+ Advanced Mathematics (Hons)
+ Advanced Science (Hons)
+ Arts
+ Commerce
+ Computer Science
+ Engineering Science
+ Law
+ Music (Hons or Pass)
+ Science

Bachelor of Computer Science is offered in combination with:
+ Advanced Mathematics (Hons)
+ Advanced Science (Hons)
+ Arts

Dual Bachelor degrees combining:
+ Civil Engineering/Environmental Engineering
+ Civil Engineering/Mining Engineering
+ Civil Engineering/Surveying
+ Materials Science and Engineering/Chemical Engineering

Bachelor/Master dual awards:
+ Bachelor of Engineering (Hons)/Master of Biomedical Engineering in Bioinformatics, Chemical, Computer, Electrical, Materials Engineering, Mechanical, Mechatronics, Software and Telecommunications
+ Bachelor of Engineering (Hons)/Master of Engineering (Electrical Engineering) (BE (Hons)/ME (Elec))

Postgraduate programs

Masters by coursework
Master of Engineering Science (MEngSc) with specialisations in:
+ Biomedical Engineering
+ Chemical Process Engineering
+ Civil Engineering
+ Electrical Engineering
+ Energy Systems Engineering
+ Environmental Engineering
+ Food Process Engineering
+ Geospatial Engineering
+ Geotechnical Engineering and Engineering Geology
+ Manufacturing Engineering and Management
+ Mechanical Engineering
+ Nuclear Engineering
+ Petroleum Engineering
+ Photovoltaics and Solar Energy Engineering
+ Project Management
+ Renewable Energy Engineering
+ Satellite Systems Engineering
+ Structural Engineering
+ Sustainable Systems Engineering
+ Systems and Control
+ Telecommunications
+ Transport Engineering
+ Water Resources: Catchments to Coast
+ Water, Wastewater and Waste Engineering

Master of Engineering (ME) with specialisations in:
+ Civil Engineering
+ Electrical Engineering
+ Environmental Engineering
+ Mechanical Engineering
+ Telecommunications

Master of Biomedical Engineering
Master of Food Science
Master of Information Technology
Master of Mining Engineering with specialisation in Mine Geomechanics and Mine Management
Master of Mine Geotechnical Engineering with specialisation in Coal Mine Strata Control and Underground Ground Control

Graduate diplomas and certificates
There are Graduate Diplomas (and some Graduate Certificates) for many of the Masters by coursework specialisations listed above.

Research degrees
+ Doctor of Philosophy (PhD)

“UNSW Computing has provided me with a solid understanding of coding, physics, electronic circuits and their real world applications.”
Ojasvi Chavali, BE (Computer Engineering)
“Being able to see a much bigger picture and understanding how things fit together is really important. The speed of things has changed so much that successful engineers need to be agile and keep learning.”

Craig Singleton BE (Mechanical Engineering and Naval Architecture), UNSW Graduate and Senior Mechanical Engineer / Naval Architect at GHD