



2020

INVENT THE FUTURE

FACULTY OF
ENGINEERING



UNSW
SYDNEY

Australia's
Global
University

experience
first

Katherine Lo

Katherine Lo is studying for a Bachelor of Engineering (Hons)/Bachelor of Commerce at UNSW.

During her studies, Katherine has taken advantage of our real-world engineering approach by securing a position with multinational engineering firm AECOM, where she works in transport planning.

"Lecturers link the learnings to real-life examples, so you get to see the practical application of the theory. We get opportunities for local and international internships because of the links and connections that UNSW Sydney has in Australia and globally" she explains.

"UNSW is always one step ahead of everyone else – the teachers, tutors and opportunities really drew me in."

KATHERINE LO

**Bachelor of Engineering (Hons)/
Bachelor of Commerce**



FIVE STAR RATING

Highest ranked university in Australia with a five star plus rating for research, employability, teaching, facilities, internationalisation, innovation and inclusiveness.

QS Stars University Ratings 2019



TOP 50 IN THE WORLD

In the 2018 QS World rankings for subjects, these UNSW Engineering subjects rank in the top 50: Minerals and Mining, 9th in the world; Civil Engineering, 15th in the world, and 1st in Australia; Chemical Engineering, 36th in the world; Computer Engineering, 41st in the world; Electrical Engineering, 36th in the world.



LARGEST ENGINEERING FACULTY IN AUSTRALIA

Offering 25 undergraduate degrees and 100+ degree combinations.



Real-world engineering

UNSW Engineering degrees don't just focus on theory. From day one, students begin to develop their acumen as engineers through the classroom, hands-on practical learning and by forming valuable networks with industry.

Opportunities include learning from industry leaders in lectures, undertaking a project in our Makerspaces, participating in a Student-led Project or the Maker Games, receiving industrial training, attending recruitment events, or learning from international exchanges or experiences. This means you get valuable real-world experience while completing your degree. It all looks great on your resume, equipping you for a successful career in industry or research.

Meeting global challenges

Make a positive difference in the world through world-class education and research, UNSW Engineering brings passion and creativity to meet global challenges. We combine the world's best facilities and research with an exciting education experience to open doors for our graduates.

Industry engagement

At UNSW Engineering, we're committed to bridging the gap between university and industry. Students are equipped with the skills and competencies for success in industry. Each year, we host over 16 industry and student networking events, empowering you to build professional networks and kickstart your career!

Student-led societies

UNSW Engineering's flagship societies, EngSoc and WIESoc, host a variety of professional development programs, professional networking events and social activities throughout the year. Student-Led Societies aim to enrich the student experience whilst developing student skills.

More degrees, more choice

We have more engineering degree specialisations than anywhere else in Australia. You can explore more than 20 undergraduate engineering degree specialisations, with multiple dual degree combinations – including architecture, arts, science, commerce and media.

Women in Engineering

We pride ourselves on providing a dedicated support network to the Women in Engineering (WIE) community. You can even attend WIE workshops and inspiring events on campus before you start university. With industry scholarships, bespoke mentoring, development opportunities and a calendar packed with industry events, we aim to ensure our female engineering students emerge from UNSW as highly employable and qualified professionals.

Find out more at unsw.to/wie.

Student-led projects

Student-led Projects encourage our students to have fun working on practical, real-world engineering projects while completing their degree. From space technology to robotics to humanitarian initiatives, each of our Student-Led Projects come with their own unique set of opportunities. Student-Led Projects are a fantastic way to build friendships and make the most of your university experience.

Find out more at unsw.to/engslp.

Industrial training

Students undertake 60 days of work experience in their chosen field of study to qualify for accreditation from Engineers Australia, giving them real experience in an engineering environment to develop skills and contacts for their future career.

Find out more at unsw.to/experience-eng.

Bachelor of Science (Computer Science)

Duration 3 years

2019 Lowest ATAR¹ 86.45

2019 Lowest Selection Rank² 93.00

2020 GE Rank³ 93.00

Assumed knowledge Mathematics Extension 1

Alternative pathway

The Faculty of Engineering Admissions Scheme (FEAS)⁴ is available for this degree. Find out more at unsw.to/feas.

In this degree you will study the design, construction and use of computer systems. You'll gain expertise in the basic principles

behind computing tools, operating systems, compilers, translators and computer hardware, and learn about the design and development of hardware and software tools for developing computer applications.

Career opportunities

Graduates are employed in fields such as software engineering and development, digital security, database development, game development and systems analysis.

Study areas

- Artificial Intelligence
- Human-computer Interactions
- Computer Networks

- Databases Systems
- E-commerce
- Robotics
- Programming Languages
- Embedded Systems
- Security Engineering

Combine this degree with:

Advanced Mathematics (Hons), Advanced Science (Hons), Arts, Commerce, Engineering (Hons), Law, Media Arts, Science

Structure

16 Computer Science courses

+

Elective/General
Education electives (8 courses)

+

Possible minor in Accounting, Finance, Information
Systems, Marketing, Maths, Psychology

Bachelor of Engineering (Honours)

Duration 4 years

2019 Lowest ATAR¹ 86.10

2019 Lowest Selection Rank² 93.00

2020 GE Rank³ 93.00

Assumed knowledge Mathematics Extension 1 and Physics (except where specified)

Alternative pathway

The Faculty of Engineering Admissions Scheme (FEAS)⁴ is available for this degree. Find out more at unsw.to/feas.

Combining mathematics, natural sciences and computing, this degree is the foundation for a variety of specialised pathways into different engineering disciplines. You will learn how to apply yourself in engineering design and enquiry projects as well as professional practice, management and research for your thesis. There's flexibility in the first year for students who haven't yet decided their engineering specialisation.

Flexible first year stream

The Bachelor of Engineering (Honours) program includes a Flexible First Year stream.

This stream is designed for those students who wish to study engineering but would like to delay their choice of which branch of engineering to study until the end of Year 1. The first year of engineering study has a common core of courses, plus a wide choice of electives which allows you to study a number of areas that appeal to you without making a formal commitment until the end of your first year. This is ideal for students who know they want to be an engineer, but are unsure which direction to take.

Structure

Chosen discipline, including thesis project in final year

+

Electives

+

General Education electives

+

60 days industrial training

Aerospace Engineering (Honours)

Immerse yourself in the science and practice of air and space flight with this exciting degree. You'll cover design, development, testing and production of aerospace vehicles, maintenance and operation of aircraft, and aerospace research. In your final year you'll execute a team project, applying your skills through internationally-approved industry training.

Career opportunities

Graduates pursue careers in a number of fields such as the space industry, national security, transportation, airlines, maritime construction and consulting.

Study areas

- Aerodynamics
- Space Craft
- Flight Mechanics
- Structures
- Propulsion
- Systems

This degree is professionally recognised.

Bioinformatics Engineering (Honours)

Assumed knowledge Mathematics Extension 1 and Chemistry

Master the foundational disciplines of bioinformatics, a field at the convergence of computing and life sciences. In this degree you will learn how to develop technologies for storing, extracting, organising and interpreting the tsunami of genetic information to which we now have access.

Career opportunities

Bioinformatics graduates work in a variety of industries including bioinformatics, pharmaceutical, agritech, banking and finance, big data, consulting, development, digital services, education, health, I.T., logistics, research, software engineering and computer security.

Study areas

- Computing
- Mathematics
- Biology
- Bioinformatics (the integration of computing maths and biology)

Chemical Engineering (Honours)

This broad degree covers the critical steps in a product's creation, from the pure chemistry to the economics. You will discover how to design and develop chemical processes and equipment, optimise and control industrial operations, work with nanoparticles, determine environmental effects and pollution control – and much more.

Career opportunities

Chemical engineers work in a variety of fields including food and drink development, environmental management, mining and minerals, oil and gas, paper and packaging, pharmaceuticals, water treatment and recycling.

Study areas

- Chemical Engineering

Chemical Product Engineering (Honours)

Assumed knowledge Mathematics Extension 1, Physics and Chemistry

With a focus on product design and development, Chemical Product Engineering is the new frontier for chemical engineers. You'll graduate from this degree with everything you need to create products across a wide range of industries.

Career opportunities

As a Chemical Product Engineer you can pursue a career as a Chemical and Materials Engineer, Chemist, Food and Wine Scientist, Production Manager (Manufacturing), Production or Plant Engineer, Product Tester, Research and Development Manager.

Study areas

- Industrial Chemistry

Civil Engineering (Honours)

Civil engineers are responsible for projects that enhance the overall quality of life. In this degree you'll learn how to design, construct, manage, operate and maintain the infrastructure that supports modern society.

Career opportunities

Graduates are employed by professional consulting firms, construction companies, large public companies, government organisations and financial and management consultancies.

Study Areas

- Civil Engineering
- Engineering Construction and Management
- Geotechnical Engineering
- Structural Engineering
- Transport Engineering
- Water Engineering

We are ranked 15th in the world, and 1st in Australia for Engineering – Civil and Structural. QS World University Rankings by Subject, 2018.

Mining Engineering (Honours)

This degree gives you a comprehensive understanding of how complex mining systems work together to service the global need for minerals. You will acquire a solid foundation of engineering principles and the essential elements of mining, including geomechanics, ventilation, mine planning and minerals processing.

Career opportunities

Graduates enjoy fruitful careers in areas such as drilling, project management, sustainability, quarry and tunnelling, community relations and management consulting in mining companies, investment firms, finance, banking and government organisations.

Study areas

- Mining Engineering
- Geotechnical Engineering
- Mine Design and Planning
- Mining Management and Sustainability
- Mining Systems
- Mining Technologies
- Rock Breakage

We are ranked 9th in the world for Engineering – Mineral and Mining. QS World University Rankings by Subject, 2018

Electrical Engineering (Honours)

This degree focuses on the design, development, manufacture and management of complex hardware and software systems. With courses in telecommunications, photonics, microelectronics and more.

Career opportunities

Electrical Engineering opens up a huge range of challenging and rewarding career paths in fields such as electronics, quantum computing, networking, power distribution and robotics and control.

Study areas

- Energy Systems
- Microsystems
- Photonics
- Systems and Control
- Signal Processing
- Wireless and Data Networks

We are ranked 36th in the world for Engineering – Electrical. QS World University Rankings by Subject, 2018.

Environmental Engineering (Honours)

Combine a broad knowledge of engineering and environmental processes in this unique degree. You'll learn to identify environmental problems and impacts caused by engineering projects and to develop effective solutions. Your work will be at the centre of an exciting multidisciplinary field including biologists, ecologists, geologists and engineers.

Career opportunities

There is a broad range of career opportunities available to Environmental Engineers across the water, construction, energy, and manufacturing industries. Graduates also seek employment in humanitarian engineering and sustainability with both government organisations and in the private sector.

Study areas

- Environmental Engineering
- Environmental Studies
- Geotechnical Engineering
- Transport Engineering
- Water and Waste Engineering

Mechanical and Manufacturing Engineering (Honours)

Bridge the gap between new designs and their execution with Mechanical and Manufacturing Engineering. You'll learn how to design and manage the construction, operation and maintenance of equipment used in many industries – nearly anything that people drive, play with or live in.

Career opportunities

Graduates work in a variety of industries such as automotive, defence, aerospace, transport, power generation, insurance, railway systems and management consultancy.

Study areas

- Computer Aided Manufacturing (CAM)
- Computer Aided Design (CAD)
- Materials Science
- Process Technology and Automation
- Process Modelling and Simulation
- Reliability and Maintenance Engineering
- Fluid Dynamics
- Thermodynamics
- Mechanics of Solids

Mechanical Engineering (Honours)

Any design you could dream of can be brought to reality by a mechanical engineer. Mechanical engineers apply scientific and engineering knowledge to develop, manufacture and operate machines and tools, which can then be used to develop things. This degree teaches you how to design and manage the construction, operation and maintenance of machines used in many industries.

Career opportunities

There is high demand for Mechanical Engineering graduates in a wide range of industries such as power generation, transport, construction, mining, manufacturing, insurance and appliances.

Study areas

- Composite Structures
- Computer Aided Design (CAD)
- Computer Aided Manufacturing (CAM)
- Fluid Dynamics
- Heat Transfer
- Materials Science
- Noise and Vibration
- Power Generation
- Thermodynamics

Mechatronic Engineering (Honours)

This degree teaches you the full spectrum of smart machine design. You'll graduate with skills in the development of autonomous systems like self-operating robots and vehicles, and a thorough knowledge of industrial automation which can be applied throughout the evolving field of smart machines and systems.

Career opportunities

Mechatronic Engineers work in many industries such as manufacturing, automotive, aerospace, defence, mining, cargo handling and agriculture. You may also work in companies that design and manufacture consumer devices and technology such as mobile phones, video game consoles and biomedical devices.

Study areas

- Computing
- Control Systems
- Electronics
- Mechanical Design Skills
- Microprocessors

Computer Engineering (Honours)

Computer Engineering will empower you to make a difference in today's world, where the internet, cars and phones are a fundamental element of people's lives. Your study combines computer science with elements of electrical engineering, while designing programs and building hardware

Career opportunities

Computer Engineering graduates work in a variety of industries including technology manufacturing, research laboratories, I.T., digital consulting firms, agritech businesses, banking, finance, health and education industries, VLSI Design and embedded systems.

Study areas

- Embedded Systems
- Telecommunications
- Electronics
- System and Control
- Advanced Computing

Photovoltaics and Solar Energy Engineering (Honours)

In this degree you'll immerse yourself in the manufacture and use of solar cells, which capture and convert sunlight into electricity. Courses in technology development, manufacturing, quality control, reliability, policy, system design and more will prepare you for varied, high-level work in an industry that is vital for humanity's future.

Career opportunities

Graduates work in fields such as manufacturing, quality control and reliability, computer-aided design of devices and systems, policy formation, programs for developing countries, solar cells and system design in organisations such as integration companies and research organisations.

Study areas

- Cell Interconnection and Encapsulation
- Manufacturing
- Photovoltaics
- Policy Development
- Quality Control
- Reliability and Life-Cycle Analysis
- Renewable Energy Technologies
- Solar Cell Applications
- Solar Energy
- Technology Development

Renewable Energy Engineering (Honours)

Explore the best ways to make use of renewable energy technologies in this cutting-edge degree. From solar thermal systems and photovoltaics to winds and biomass, you'll draw resources from all around UNSW to prepare you for research and professional work in this crucial, ever-growing industry.

Career opportunities

Graduates can work in a wide range of fields and companies in designing, installing and operating renewable energy generating systems such as wind, solar, biomass or hydro systems, as well as construction of energy efficient technology or buildings, policy, programs for developing countries and research organisations.

Study areas

- Biomass
- Energy Efficiency and Appliances
- Geothermal Systems
- Hydro Turbine
- Photovoltaics
- Renewable Energy
- Solar Architecture
- Solar Thermal Systems
- Tidal and Wave Energy
- Wind Power

Surveying (Honours)

Surveying: a perfect combination of indoors and outdoors, from supporting construction and infrastructure engineering to mapping and monitoring the landscape. In this degree you'll learn how to use GPS, laser scanners, mapping drones and surveying robots to create high-definition 3D models of both the built and natural environments.

Career opportunities

Surveying graduates work in a variety of fields including urban and rural development, oil and gas exploration, mining and engineering construction, climate change monitoring, land management and planning, cadastral surveying and land law, hydrographic surveying as well as aerial imaging and cartography.

Study areas

- Engineering and Mining Surveying
- Cadastral Surveying and Land Law
- Modern Geodesy
- Navigation and Earth Observation
- Precise GPS/GNSS Positioning
- Satellite and Airborne Imaging
- Surveying Applications and Design
- Business Management
- Sustainable Land Development and Management
- Water and Soil Engineering

Petroleum Engineering (Honours)

Become an expert at solving problems and designing technologies that work kilometres underground. In this degree you'll learn to apply practical science to the challenges and problems associated with oil and gas exploration, drilling and production. You'll also study courses that engage you in the socio-political context of the industry.

Career opportunities

Graduates may pursue careers in the oil and gas industry, oil service companies, reservoir development, computer-generated modelling, environmental organisations, and, banking and finance.

Study areas

- Computer Modelling and Simulation of Oil and Gas Resources
- Drilling Engineering
- Formation Evaluation
- Integrated Field Development
- Natural Gas Engineering
- Petroleum Geology and Geostatistics
- Petroleum Economics
- Reservoir Engineering

Software Engineering (Honours)

Assumed knowledge

Mathematics Extension 1

Become an expert in the processes, methods and tools for the design and development of high-quality, reliable software systems, from code-writing to delivery. This degree involves the application of software specification, design, implementation, testing and more, including workshops for team-based projects that will give you hands-on experience.

Career opportunities

As a Software Engineer you can pursue a career in big data, electronics, logistics, security, defence and telecommunications in various industries including education, health, banking and finance.

Study areas

- Software Engineering
- Software Development
- Software Process
- System Design

Telecommunications (Honours)

In this degree you'll learn all aspects of theory and application for a broad range of telecommunications systems such as telephone and data networks, radio and TV, satellites and deep space applications. You'll learn how to design, develop and maintain the transmission of information via different methods across the world.

Career opportunities

Graduates pursue careers with telecommunications service providers, major equipment and device manufacturers, large private industrial groups as well as small to medium service and technology providers or startups.

Study areas

- Data Communications Systems
- Data Encoding
- Compression and Encryption
- Satellite and Optical Fibre Networks
- Voice Communication Systems

Bachelor of Civil Engineering with Architecture (Honours)

Duration 4 years

2019 Lowest ATAR¹ 87.95

2019 Lowest Selection Rank² 95.00

2020 GE Rank³ 95.00

Assumed knowledge Mathematics Extension 1 and Physics

Structure

Extend your civil engineering bachelor degree with this program's courses in architecture. You'll get a foundation in architectural principles and learn about the connection between architects and engineers, inspiring you to become a conceptual thinker with both aesthetic and structural expertise – and to challenge the traditional boundaries of structural design.

Career opportunities

Graduates are employed by specialist structural engineering consultants, construction and contracting companies, federal, state, and local government organisations, airport and harbour authorities, project developers, financial organisations and management consultancies.

Study areas

- Civil Engineering
- Architecture

Civil Engineering discipline, including thesis project in final year

+

Architecture subjects

+

60 days industrial training

How to apply

Getting offered a place is competitive and entry into our undergraduate degrees is based on academic merit. Entry is assessed by your performance in a qualification such as the HSC, VCE, IB or any other recognised qualifications. For more information, visit futurestudents.unsw.edu.au/how-to-apply.

Domestic applicants

(Australian citizens, Australian permanent residents, Australian permanent humanitarian visa holders and New Zealand citizens)

All applications for undergraduate study by domestic applicants are made through the University Admissions Centre (UAC). To lodge your application, visit uac.edu.au/undergraduate/apply.

As a domestic student, you may be eligible for adjustment factors including HSC Plus, Elite Athletes, Performers and Leaders and the Educational Access Scheme. To find out more about adjustment factors and how to apply, visit futurestudents.unsw.edu.au.

Guaranteed Entry Rank (ATAR + adjustment factors) allows us to tell you what selection rank will guarantee you a place in a particular degree at UNSW. For more information, visit unsw.edu.au/ge.

Alternate pathways to UNSW Engineering

The 2019 Guaranteed Entry Rank for engineering degrees at UNSW are among the highest in the country. If you don't achieve the selection rank required for Guaranteed Entry, we recognise that this doesn't mean you can't become a successful engineer. You could still enrol through an alternative pathway.

Faculty of Engineering Admission Scheme (FEAS)

We know that things don't always go to plan, and sometimes you need to take a different route. If you are expecting an ATAR (or equivalent including applicable adjustment factors) between 83.00 to 92.95 and want to study Engineering at UNSW, we encourage you to apply for FEAS. There's still a chance you can enrol at UNSW Engineering.

We will evaluate your ability in mathematics, physics and other sciences, design and problem solving, as well as attitude and motivation towards engineering studies.

FEAS applies to most UNSW Engineering undergraduate programs, including the double degrees with a GE of 93.

Visit unsw.to/feas.

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The information contained in this publication with regard to Assumed Knowledge pertains to HSC subjects. For students studying a different but equivalent qualification please contact the Universities Admissions Centre (UAC) for further information.

The information contained in this publication applies to Australian citizens, Australian permanent residents, Australian permanent humanitarian visa holders and New Zealand citizens only. All international students should contact UNSW Future Students on 1300 864 679 for admission procedures and degree information.

NOTES

1. The 2019 Lowest ATAR is the lowest ATAR (before adjustment factors were applied) to which an offer was made.
2. The 2019 Lowest Selection Rank is the adjusted rank (ATAR plus adjustment factors) you would have needed to gain entry to this degree in 2019. To see a complete picture of UNSW offer data, visit degrees.unsw.edu.au.
3. For more information on Guaranteed Entry, please visit unsw.edu.au/ge.
4. The Faculty of Engineering Admissions Scheme (FEAS) is available for most UNSW Engineering undergraduate programs, including the double degrees with a GE of 93. For more information, visit unsw.to/feas.

UNSW Engineering

Ask a question unsw.edu.au/ask

Call 1300 UNI NSW (1300 864 679)

Visit engineering.unsw.edu.au

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