



UNSW Engineering

Bachelor of Engineering (Honours) (Quantum Engineering)

What do quantum engineers do?

Open a world of possibility with the first undergraduate Quantum Engineering degree in the world. You'll study at a School that's an international pioneer in silicon quantum engineering. Quantum Engineering combines the broad skills of engineering with fundamental physics in a unique way that allows engineers to solve contemporary problems and engineer solutions for the future. Quantum mechanics opens the doors for Quantum Engineers to leverage quantum physics to deliver unprecedented solutions to engineering problems.

When you study Quantum Engineering at UNSW, you'll develop the skillset required for the next generation of microelectronics, microwave and telecommunications engineers. Learn how to work with a range of quantum systems, from high-frequency signals to very small electronic

circuits. Our expert academics will teach you about novel systems where the quantum phenomenon is the core aspect such as quantum computers, quantum sensors and quantum communications. This degree will help you develop a range of electrical engineering skills meaning graduates can also find employment in traditional industries such as telecommunications, automation, electronics and signal processing.

UNSW Electrical Engineering and Telecommunications

- We are ranked #1 in Australia and 41st globally for Electrical Engineering in the 2023 QS World University Rankings.
- Our strong industry links provide students and graduates with professional opportunities.
- Take part and learn from world-renowned research projects.
- Our facilities are globally recognised for developing practical experience.

Program details

Lowest Selection Rank (2023): 90

Duration: Four-year embedded honours degree

Study areas: Programming Fundamentals, Digital Circuit Design, Electronics, Quantum Physics of Solids and Devices, Quantum Devices and Computers, Quantum Communications and Photonic Networks

Assumed knowledge: HSC level Mathematics Extension 1, Physics

Portfolio Entry: UNSW offers the Faculty of Engineering Admission Scheme (FEAS) which is a pathway for students interested in studying undergraduate engineering to support their academic results, find out more at unsw.to/feas

Accreditation

The Faculty of Engineering has applied for provisional accreditation with Engineers Australia for Quantum Engineering. When approved, students will be able to work in the global Quantum Engineering Industry.

Career options

Quantum Engineering is rapidly growing worldwide. There are thousands of quantum engineering jobs in the private sector. Leading companies like Microsoft and IBM have large quantum engineering efforts. Local start-ups like Q-CTRL and SQC offer a growing number of opportunities. CSIRO and DST also have large initiatives in quantum sensing and metrology.

Graduates can also find employment in traditional industries such as telecommunications, automation, electronics and signal processing.

"Quantum Engineering is the microelectronics and microwave engineering of the 21st century. Any engineer who works with next-generation electronic and communication devices will need to understand and exploit the quantum nature of these technologies. This is why we created the new degree."

Scientia Professor Andrea Morello



Example study plan

	TERM 1			TERM 2			TERM 3		
YEAR 1	Introduction to Engineering Design & Innovation	Electrical Circuit Fundamentals	Mathematics 1A or Higher Mathematics 1A	Higher Physics 1A	Programming Fundamentals	Mathematics 1B or Higher Mathematics 1B	Mathematics 2A	Higher Physics 1B	
YEAR 2	Circuits and signals	Digital Circuit Design	Electromagnetic Engineering	Engineering Design and Professional Practice	Analogue Electronics	Mathematics 2B	Fundamentals of Quantum Engineering	General Education	Digital Signal Processing
YEAR 3	General Education	Electronics	Quantum Communications	Electrical Engineering Design	Control Systems	Quantum Physics of Solids and Devices	Elective	Elective	
YEAR 4	Elective	Strategic Leadership & Ethics	Thesis A	Elective	Thesis B		Electrical Design Proficiency	Quantum Devices and Computers	Thesis C

You'll be required to complete 60 days of Industrial Training throughout your degree.

This is a sample degree outline only and may be subject to change. Please refer to the UNSW Handbook for further information and relevant course codes.