BACHELOR OF

ENGINEERING WITH HONOURS

Are you someone who likes solving problems and building things? If so, you should consider a degree in Engineering or Computer Science. You could be the person who makes the next major breakthrough in climate-change technology, helps save a life, builds the next big game, or starts the next Instagram.

Our Tohu Paetahi Pūkaha (Hōnore)—Bachelor of Engineering with Honours (BE(Hons)) focuses on the design and implementation of real-world systems. Right from the start, you will gain core skills and apply them to design and build exciting technology such as autonomous robots and computer games, or design and build secure computing systems.

You will take courses in topics such as artificial intelligence, computer systems, cybersecurity, electronics, networking, renewable energy systems, robotics, and software development. By studying multiple topics, you will gain both the in-depth knowledge to contribute to solving real-world problems and the breadth to understand how different strands of engineering connect together.

Engineers are some of the most sought-after people in the modern world. You will graduate as a skilled professional and be able to choose from many interesting and well-paid careers.

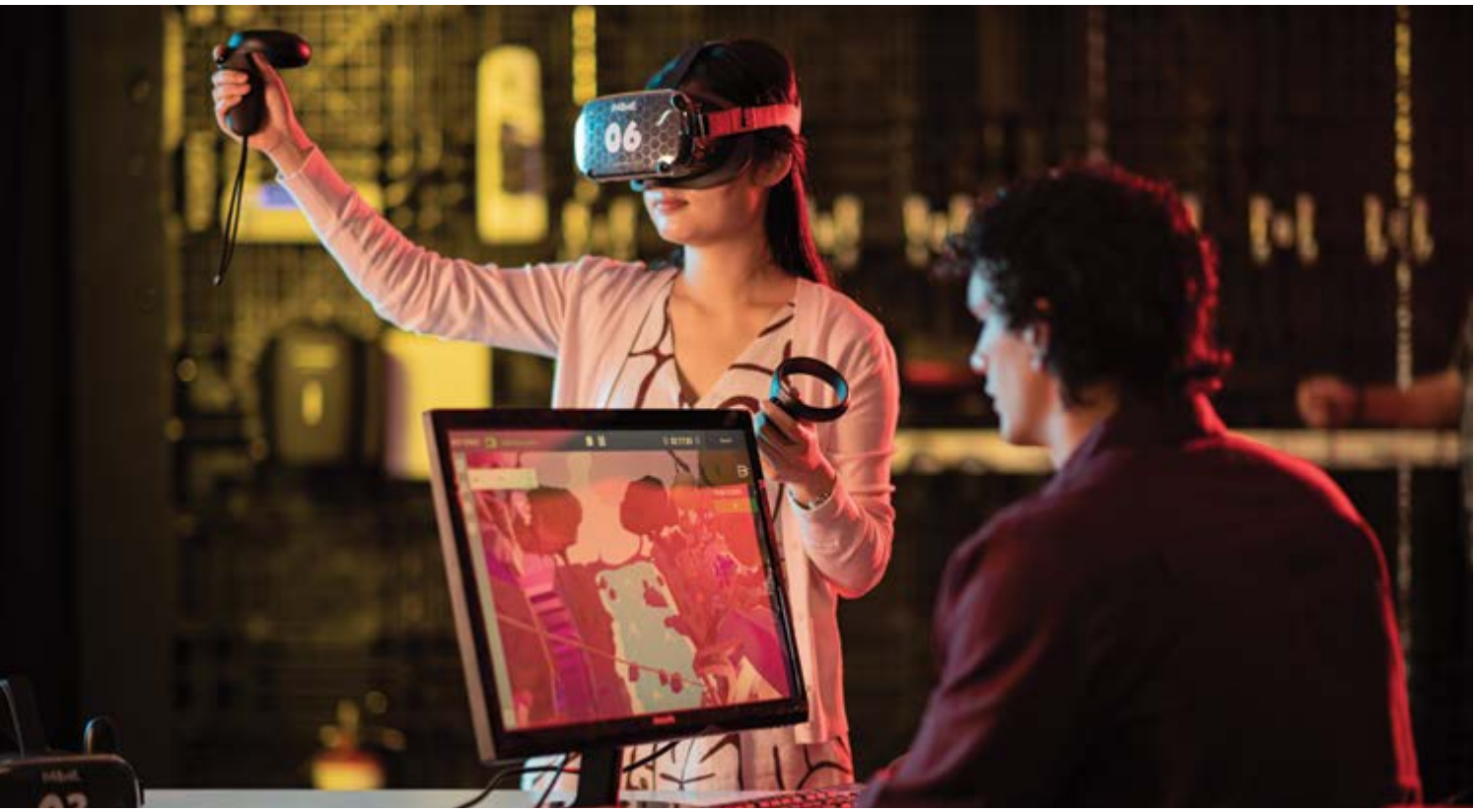
Our researchers have developed audio coders that form the basis for internet telephony, edited world-leading technical journals, created their own programming languages, developed clean energy systems, and monitored the Antarctic ice sheets with magnetic resonance.

The Software Engineering major in the BE(Hons) has been recognised with full accreditation by both Engineering New Zealand under the Washington Accord and IT Professionals New Zealand under the Seoul Accord, making it one of the few dual-accredited software engineering degrees in the world.

The Electrical and Electronic Engineering major is fully accredited by Engineering New Zealand under the Washington Accord. Our new Cybersecurity Engineering major is going through the same rigorous accreditation process, and has been granted provisional accreditation as an acknowledgment of the quality of the programme.

FIND OUT MORE

info@vuw.ac.nz
www.wgtn.ac.nz/be
www.wgtn.ac.nz/engineering



CAREER OPPORTUNITIES

The BE(Hons) leads to careers in a range of exciting jobs, including advanced research, artificial intelligence, computer-game design, computer graphics, cybersecurity, electric power, healthcare, mechatronics, mobile communications, multimedia programming, renewable energy, robotics, web innovation, and a variety of software and hardware systems design and development roles.

ⓘ www.wgtn.ac.nz/careers

POSTGRADUATE STUDY

We provide a range of Master's and PhD opportunities in diverse and interesting engineering fields, from robotic music to active vision and artificial intelligence to internet security.

ⓘ www.wgtn.ac.nz/engineering/postgraduate

SCHOOL SUBJECTS

Recommended subjects to study at school include Digital Technologies, Mathematics, Science, Statistics, and Technology. If you're planning to study Electrical and Electronic Engineering, we highly recommend studying Physics and Calculus.

MAJORS

Cybersecurity Engineering (CYBR) covers a range of technology-based courses that focus on protecting and safeguarding networks and data from unauthorised access. The programme also covers topics from various disciplines, including ethics, law, policy, risk management, and social and human factors, which will help you learn how to recognise threats and develop the practical skills needed to mitigate them.

Electrical and Electronic Engineering (EEEN) encompasses a range of disciplines from the fundamental electrical characteristics of materials to the abstraction of data in signal processing. It also includes robotics, renewable energy, and embedded systems, and focuses on the design and development of electronic-based systems to solve real-world problems.

Software Engineering (SWEN) enables you to design, implement, and maintain complex computer systems. You will learn to build and programme software systems that are efficient, robust, reliable and secure, and usable. Our graduates are leaders in the field of technology that drives the world.

ADMISSION TO THE DEGREE

In addition to the admission requirements on page 24, we encourage you to have passed some credits in NCEA Level 3 Mathematics for all three majors offered under the BE(Hons) degree. The mathematics pathways available to you in the degree will depend on the number of NCEA credits you have passed, or equivalent achievement in another qualification type.

It is also suggested that students interested in Electrical and Electronic Engineering, or Electronic and Computer Systems under the Bachelor of Science (see page 124), have some NCEA Level 3 Physics and Calculus credits. You can discuss entry requirements for specific courses with a student success adviser.

If you are applying with Cambridge Assessment International Education (CAIE) or International Baccalaureate (IB), you should contact your student success adviser for equivalents.

For more details, go to www.wgtn.ac.nz/be-apply

DEGREE REQUIREMENTS

Four years of full-time study.

A total of 480 points is required, including:

- the requirements for one major subject (see page 92)
- a set of core engineering courses from 100 level to 400 level, including professional practice courses that help you develop a professional approach to engineering
- at least 120 points at 400 level and above, from courses listed for the BE(Hons)
- additional courses to bring the total number of points to 480. These may be selected from any courses offered by the University.

You must also complete at least 800 hours of employment or work experience in an approved engineering environment. We will help you prepare to apply for, and work in, appropriate employment. The work experience normally occurs in the summers following your second and third years of study.

Other important information

The BE(Hons) degree is made up of two parts that you'll need to complete. The key features of the degree are listed below:

- You must complete seven or eight 100-level courses that provide the necessary foundations for the BE(Hons). Make sure you take the right courses for your chosen major (see the tables on the following pages).
- If you're unsure about which major you're interested in, speak to your student success adviser about selecting courses that keep your options open.
- To successfully complete Part 1 of the BE(Hons), you'll need to pass all required Part 1 courses (core set of 100-level courses for each major) with at least a B average. If you have a lower average, you'll be able to transfer your courses to a Bachelor of Science (BSc).
- Some courses are common to all majors, but most are specific to the major you wish to study. Of the courses specified for each major, some are mandatory, and you can choose others from a range of courses.

Honours will be awarded to students with good academic achievement in their third and fourth years of study.

MAJOR REQUIREMENTS

It is recommended that you apply for admission as soon as possible (see page 22 for details).

The requirements listed below are the requirements to complete a major; degree regulations are listed in the University's *Calendar*.

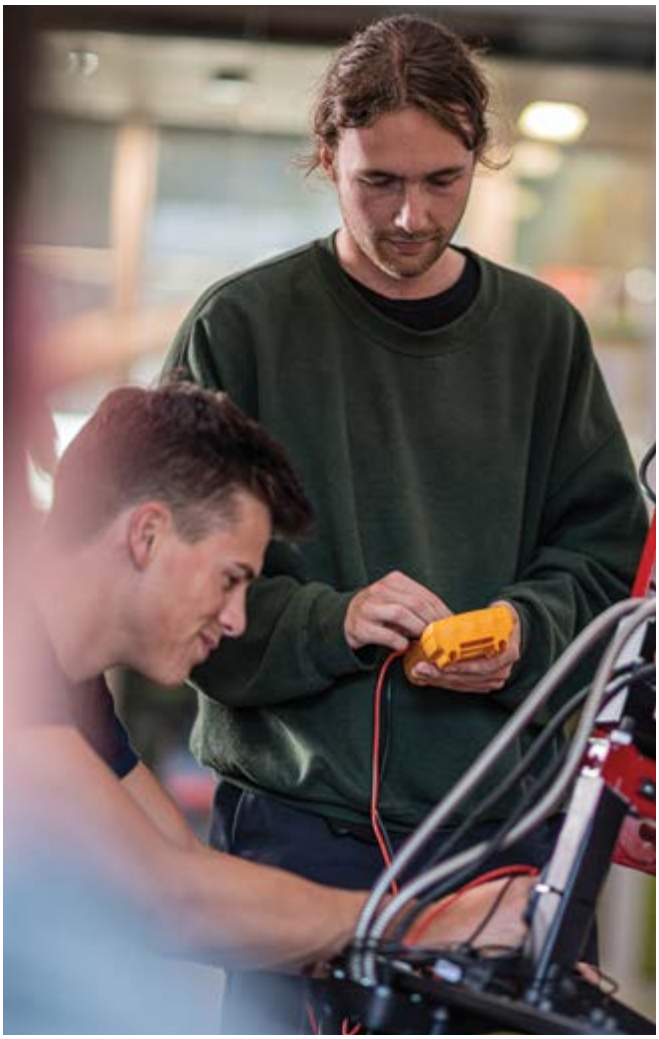
Cybersecurity Engineering (CYBR)	
100-level courses	COMP 102 or COMP 112, ENGR 101, ENGR 110, COMP 103, CYBR 171, ENGR 121, ENGR 123*
200-level courses	COMP 261, CYBR 271, NWEN 241, NWEN 243, SWEN 221; SWEN 225 or one of MATH 200–299
300-level courses	CYBR 371, CYBR 372, CYBR 373, and one of MATH 324, NWEN 301–304, SWEN 324, SWEN 326
400-level courses	CYBR 471, CYBR 472, CYBR 473, and one further 400-level course from AIML, CYBR, COMP, NWEN, SWEN

Electrical and Electronic Engineering (EEEN)	
100-level courses	COMP 102 or COMP 112, COMP 103, ENGR 101, ENGR 110, ENGR 121, ENGR 122*, ENGR 141, ENGR 142
200-level courses	EEEN 201, EEEN 202, EEEN 203, EEEN 204, EEEN 220, ENGR 222, NWEN 241
300-level courses	EEEN 301, EEEN 313, EEEN 315, EEEN 320, and two further elective courses that may be used to meet the requirements of one of the EEEN specialisations
400-level courses	EEEN 401, and at least three courses from EEEN 402–439, AIML 425, AIML 429, RESE 411, RESE 412

Software Engineering (SWEN)	
100-level courses	COMP 102 or COMP 112, COMP 103, CYBR 171, ENGR 101, ENGR 110, ENGR 121, ENGR 123*, and one of CGRA 151, ENGR 141, ENGR 142, or PHYS 100–199
200-level courses	COMP 261, CYBR 271, NWEN 241, NWEN 243, SWEN 221, SWEN 225
300-level courses	SWEN 301; SWEN 303 or SWEN 325, SWEN 324 or SWEN 326, and at least one further course from AIML, CGRA, CYBR, COMP, NWEN, SWEN 301–399
400-level courses	At least two courses from NWEN, SWEN 401–479, at least two further courses from AIML, CGRA, COMP, CYBR, NWEN, SWEN 401–479

All students will need to complete the professional practice courses (ENGR 201, ENGR 301, ENGR 302, ENGR 401, ENGR 489), and additional courses to make up a total of 480 points.

*Alternative mathematics courses are possible for students with a strong mathematics background who would like to do further mathematics courses out of interest in later years. You can discuss these options with the staff.



DEGREE EXAMPLES

BE(Hons) majoring in Cybersecurity Engineering

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
1/3	2/3	1/3	2/3	1/3	2/3	1/3	2/3
COMP 102 or COMP 112 15 points	COMP 103 15 points	COMP 261 15 points	NWEN 243 15 points	CYBR 371 15 points	CYBR 373 15 points	CYBR 471 15 points	CYBR 473 15 points
ENGR 101 15 points	ENGR 110 15 points	NWEN 241 15 points	SWEN 225 15 points	300-level major 15 points	CYBR 372 15 points	400-level major 15 points	CYBR 472 15 points
ENGR 121 15 points	ENGR 123 15 points	SWEN 221 15 points	ENGR 201 15 points	ENGR 301 15 points	ENGR 302 15 points	ENGR 401 15 points	Elective 15 points
CYBR 171 15 points	Elective 15 points	Elective 15 points	CYBR 271 15 points	Elective 15 points	Elective 15 points	ENGR 489 30 points	
60 points	60 points	60 points	60 points	60 points	60 points	60 points	60 points
120 points		120 points		120 points		120 points	

Total points required: 480
Total points completed: 480

BE(Hons) majoring in Electrical and Electronic Engineering

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
1/3	2/3	1/3	2/3	1/3	2/3	1/3	2/3
COMP 102 or COMP 112 15 points	COMP 103 15 points	EEEN 202 15 points	EEEN 201 15 points	EEEN 320 15 points	EEEN 301 15 points	EEEN 401 15 points	400-level major 15 points
ENGR 101 15 points	ENGR 110 15 points	EEEN 203 15 points	EEEN 204 15 points	EEEN 315 15 points	EEEN 313 15 points	400-level major 15 points	400-level major 15 points
ENGR 121 15 points	ENGR 122 15 points	NWEN 241 15 points	ENGR 201 15 points	ENGR 301 15 points	ENGR 302 15 points	ENGR 401 15 points	Elective 15 points
ENGR 141 15 points	ENGR 142 15 points	ENGR 222 15 points	EEEN 220 15 points	Elective 15 points	Elective 15 points	ENGR 489 30 points	
60 points	60 points	60 points	60 points	60 points	60 points	60 points	60 points
120 points		120 points		120 points		120 points	

Total points required: 480
Total points completed: 480

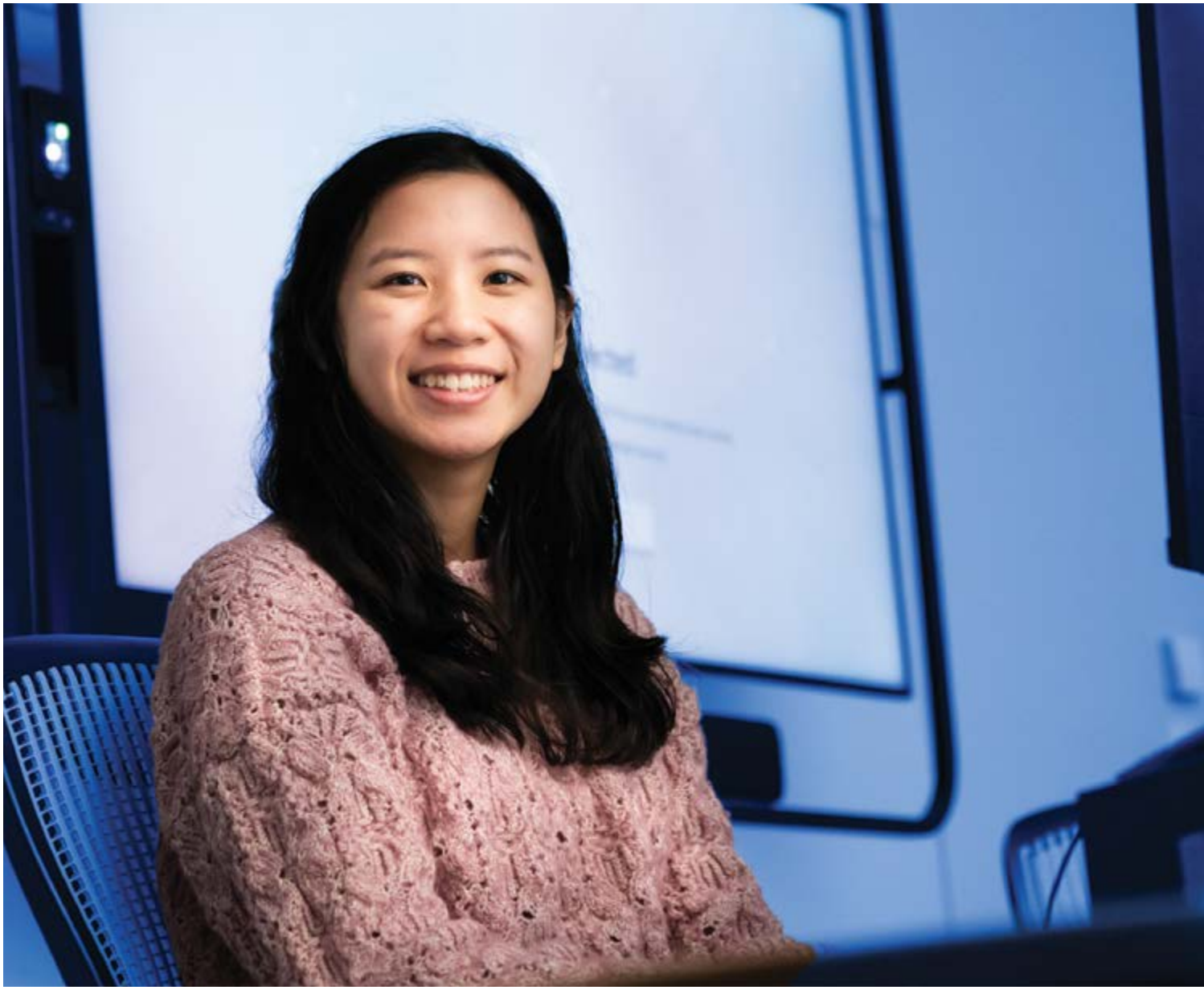
Key: Core | Major | Elective | Part 2: Professional practice

BE(Hons) majoring in Software Engineering

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
1/3	2/3	1/3	2/3	1/3	2/3	1/3	2/3
COMP 102 or COMP 112 15 points	COMP 103 15 points	NWEN 241 15 points	SWEN 225 15 points	SWEN 326 15 points	SWEN 301 15 points	400-level major 15 points	400-level major 15 points
ENGR 101 15 points	ENGR 110 15 points	SWEN 221 15 points	CYBR 271 15 points	SWEN 303 15 points	300-level major 15 points	400-level major 15 points	400-level major 15 points
ENGR 121 15 points	ENGR 123 15 points	COMP 261 15 points	NWEN 243 15 points	ENGR 301 15 points	ENGR 302 15 points	ENGR 401 15 points	Elective 15 points
CYBR 171 15 points	CGRA 151 15 points	Elective 15 points	ENGR 201 15 points	Elective 15 points	Elective 15 points	ENGR 489 30 points	
60 points	60 points	60 points	60 points	60 points	60 points	60 points	60 points
120 points		120 points		120 points		120 points	

Total points required: 480
Total points completed: 480

Key: Core | Major | Elective | Part 2: Professional practice



"There are unlimited opportunities in security, which include ones that have not yet been discovered today. As the next generation, we have the ability to govern how the world shapes our future. It will be hard, but when you see the value you bring into our society, you will find that everything you have done is worth it."

JANEL HUANG

Graduate, Bachelor of Engineering with Honours in Cybersecurity Engineering