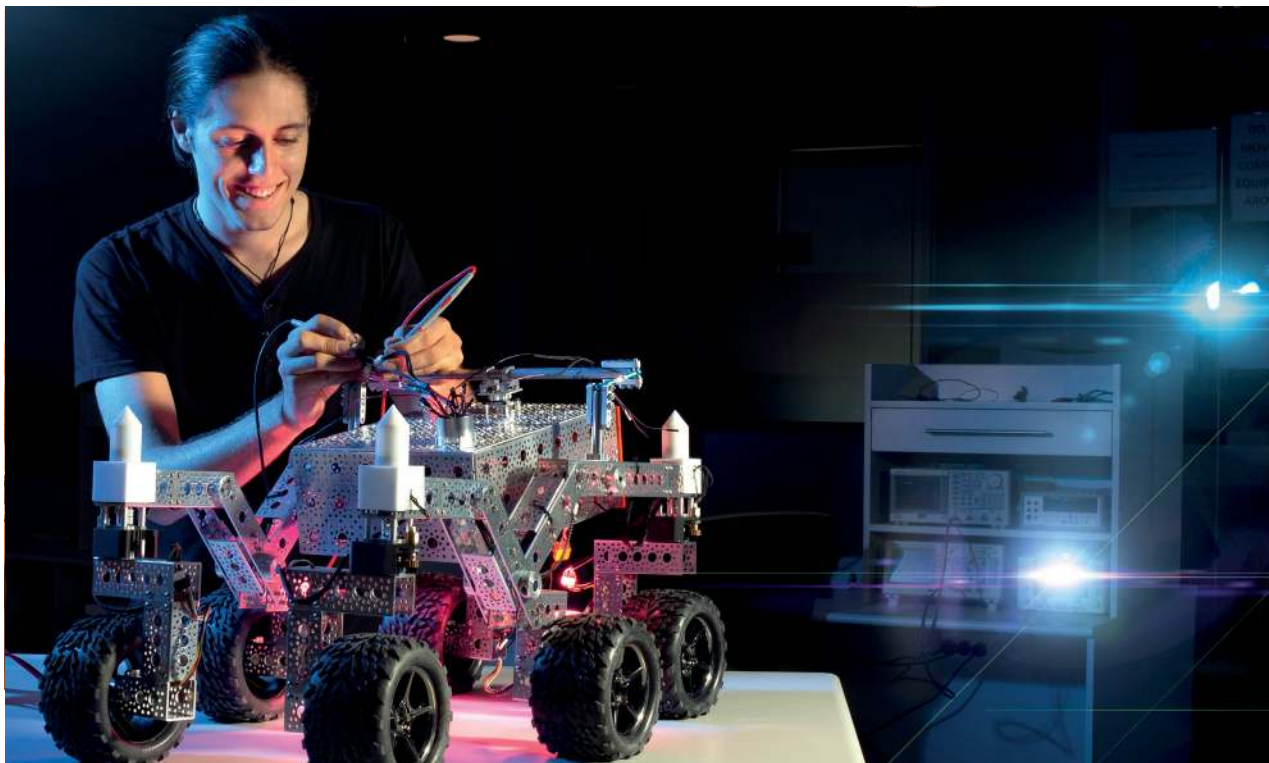


BACHELOR OF ENGINEERING

WITH HONOURS



Are you someone who likes problem-solving, being creative or making things? Do you like to understand how things work and often think, “I could improve that”? Do you want to create technology that saves lives and makes the world a better place?

If so, our Engineering programme is for you—come to Victoria University of Wellington and study with innovative people.

Our Bachelor of Engineering with Honours (BE(Hons)) focuses on the digital world so you can design and implement 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’ll take courses that cover topics such as artificial intelligence, computer systems, cybersecurity, electronics, networking, renewable energy systems, robotics, and software development. By taking courses that cover multiple topics, you’ll 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’ll graduate as a skilled professional and be able to choose from many interesting and well-paid careers.

Victoria University of Wellington was ranked first in the latest Performance-Based Research Fund Quality Evaluation and Computer Science also achieved a number one ranking. Our researchers have developed audio coders that form the basis for internet telephony, won technical Oscars for graphics, edited world-leading technical journals, created their own programming languages, developed clean energy systems, and monitored the Antarctic ice sheets with magnetic resonance.


The BE(Hons) has been granted full accreditation with Engineering New Zealand (ENZ), and our BE(Hons) in Software Engineering is also accredited by the ITP (IT Professionals New Zealand).


FIND OUT MORE ABOUT THIS DEGREE

 www.victoria.ac.nz/be

FACULTY OF ENGINEERING

Level 1, Cotton Building, Kelburn Parade, Wellington

 04 463 5101

 engineering@vuw.ac.nz

 www.victoria.ac.nz/engineering

POTENTIAL CAREERS

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

www.victoria.ac.nz/careers

POSTGRADUATE OPPORTUNITIES

There is 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.victoria.ac.nz/engineering/postgraduate

RECOMMENDED SCHOOL SUBJECTS

Recommended subjects to study at school include Digital Technologies, Maths, Science, Statistics, and Technology. If you're planning to study Electronics and Computer Systems, we highly recommend studying Physics and Calculus.

MAJORS

Cybersecurity Engineering covers a range of technology-based courses and interdisciplinary courses that include aspects of law, policy, social and human factors, ethics, and risk management. The major has been developed due to the increasing demand for cybersecurity graduates, demonstrating the rapid growth of the speciality.

Electronic and Computer Systems Engineering 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 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. Graduates are leaders in the field of modern programming, which is essential to our modern lifestyles.

Major	Code
Cybersecurity Engineering	CYBR
Electronic and Computer Systems Engineering	ECEN
Software Engineering	SWEN

ADMISSION TO THE DEGREE

In addition to the admission requirements on page 26, it is recommended that you have the NZQA requirements as below.

BE major	NCEA requirements
Cybersecurity Engineering	16 credits in NCEA Level 3 Mathematics
Electronic and Computer Systems Engineering	16 credits in NCEA Level 3 Mathematics
Software Engineering	16 credits in NCEA Level 3 Mathematics

If you are applying with Cambridge International Examinations (CIE) or International Baccalaureate (IB), you should contact the School of Engineering and Computer Science for equivalents.

If you don't have the recommended level of achievement for entry to the BE(Hons) major of your choice, you may be encouraged to apply instead for the Bachelor of Science (BSc) degree, majoring in Computer Graphics, Computer Science, Electronic and Computer Systems, or Renewable Energy Systems. You will still need to meet any entry requirements for the individual courses, such as Mathematics and Physics (see the subjects and courses pages, from page 125). You may consider transferring into the BE(Hons) at a later stage, depending on your academic progress.

DEGREE REQUIREMENTS

Four years of full-time study.

A total of 480 points is required:

- at least 120 points must be at 400 level and above, and from courses listed for the BE(Hons)
- the requirements for at least one major subject (see page 90) must be completed
- 300- and 400-level courses may be counted towards only one major.

You must also complete at least 800 hours of employment or work experience in an approved engineering environment.

Other important information

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

First-year students need to take the 100-level core courses, plus any additional 100-level courses required for their chosen major. To find out details of what a particular course is about, when it is taught, and its entry requirements, look in the subjects and courses pages (from page 125).

The BE(Hons) degree is made up of two parts that you'll need to complete.

Part 1 consists of 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). Although many courses are shared with other majors, some are different, so check carefully.

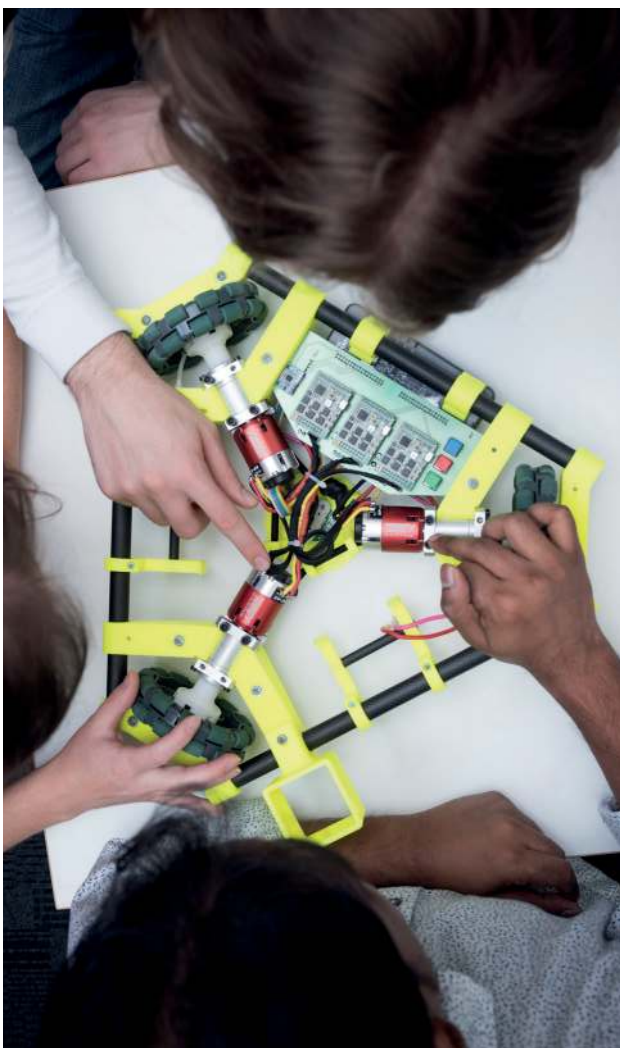
If you're unsure about which major you like, speak to staff in the School of Engineering and Computer Science about selecting courses that keep your options open.

To successfully complete Part 1 of the BE(Hons), you'll need to pass all required Part 1 courses 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).

Part 2 is the core component of the BE(Hons) and is made up of various 200-, 300-, and 400-level courses. Some courses are common to all majors, such as the professional practice and work experience, but most are specific to the major you wish to study. Professional practice contains a set of courses (ENGR 201, 301, 302, 401, and 489) required for all majors, and which develop a professional approach to engineering.

- Work experience is required for all majors and consists of three courses (ENGR 291, 391, and 491) and 800 hours of approved work experience in an engineering environment. The courses 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.
- Major courses are required (those not included within Part 1). Some of these courses are mandatory, and others may be selected from a set range of courses.

Additional courses are required in order to bring the total number of points to 480. These may be selected from any courses offered by Victoria University of Wellington.



MAJOR REQUIREMENTS

Cybersecurity Engineering	
100 level	<ul style="list-style-type: none"> ■ COMP 102 or COMP 112, COMP 103, ENGR 101, ENGR 110, CYBR 171, ENGR 121, ENGR 123
200 level	<ul style="list-style-type: none"> ■ ENGR 201, ENGR 291, COMP 261, CYBR 271, NWEN 241, NWEN 243, SWEN 221, SWEN 225 or one of MATH 200–299
300 level	<ul style="list-style-type: none"> ■ CYBR 371, CYBR 372, CYBR 373, ENGR 301, ENGR 302, ENGR 391 ■ One of MATH 324, NWEN 301–342, SWEN 324, SWEN 326
400 level	<ul style="list-style-type: none"> ■ CYBR 471, CYBR 472, CYBR 473 ■ ENGR 401, ENGR 489, ENGR 491 ■ One further 400-level course from CYBR, COMP, NWEN, SWEN

Electronic and Computer Systems Engineering	
100 level	<ul style="list-style-type: none"> ■ COMP 102 or COMP 112, COMP 103, ENGR 101, ENGR 110, ENGR 121, ENGR 122, ENGR 141, ENGR 142
200 level	<ul style="list-style-type: none"> ■ ECEN 202, ECEN 203, ECEN 204, ECEN 220, MATH 244, ENGR 201, ENGR 291 ■ At least one course from COMP 261, MATH 245, NWEN 241, NWEN 243, SWEN 221
300 level	<ul style="list-style-type: none"> ■ ECEN 301, ECEN 315, ECEN 321, ENGR 301, ENGR 302, ENGR 391 ■ At least one course from COMP 307, ECEN 302, ECEN 303, ECEN 310, NWEN 301, NWEN 302, NWEN 304, SWEN 303
400 level	<ul style="list-style-type: none"> ■ ENGR 401, ENGR 489, ENGR 491 ■ At least three courses from ECEN 401–439, ENGR 440 ■ One further course from COMP 421, ECEN 401–439, ENGR 440, ENGR 441, NWEN 402–404 or SWEN 422

Software Engineering	
100 level	<ul style="list-style-type: none"> ■ COMP 102 or COMP 112, COMP 103, ENGR 101, ENGR 110, ENGR 121, ENGR 123, CYBR 171 ■ One of CGRA 151, ENGR 141, ENGR 142, or PHYS 100–199
200 level	<ul style="list-style-type: none"> ■ ENGR 201, ENGR 291 ■ COMP 261, CYBR 271, NWEN 241, NWEN 243, SWEN 221, SWEN 225
300 level	<ul style="list-style-type: none"> ■ ENGR 301, ENGR 302, ENGR 391, SWEN 301; SWEN 303 or SWEN 325, SWEN 324 or SWEN 326 ■ At least one course from CGRA, CYBR, NWEN, SWEN 301–399
400 level	<ul style="list-style-type: none"> ■ ENGR 401, ENGR 489, ENGR 491 ■ At least two courses from NWEN, SWEN 401–479 ■ At least one further course from CGRA, COMP, CYBR, NWEN, SWEN 401–479

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	CYBR 372* 15 points	300-level major 15 points	CYBR 472 15 points	400-level major 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	ENGR 489 15 points
CYBR 171 15 points	Elective 15 points	CYBR 271 15 points	Elective 15 points	Elective 15 points	Elective 15 points	Elective 15 points	Elective 15 points
		ENGR 291 0 points		ENGR 391 0 points		ENGR 491 0 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

*Subject to regulatory approval.

BE(Hons) majoring in Electronic and Computer Systems 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	MATH 244 15 points	ECEN 204 15 points	ECEN 321 15 points	ECEN 301 15 points	400-level major 15 points	400-level major 15 points
ENGR 101 15 points	ENGR 110 15 points	ECEN 203 15 points	ECEN 220 15 points	ECEN 315 15 points	300-level major 15 points	400-level major 15 points	400-level major 15 points
ENGR 121 15 points	ENGR 122 15 points	ECEN 202 15 points	ENGR 201 15 points	ENGR 301 15 points	ENGR 302 15 points	ENGR 401 15 points	ENGR 489 15 points
ENGR 141 15 points	ENGR 142 15 points	Elective 15 points	ENGR 111 15 points	Elective 15 points	Elective 15 points	Elective 15 points	Elective 15 points
		ENGR 291 0 points		ENGR 391 0 points		ENGR 491 0 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	Part 2: Major	Part 2: Professional practice	Part 2: Work experience	Elective
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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 301 15 points	SWEN 324 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	ENGR 489 15 points
CYBR 171 15 points	CGRA 151* 15 points	Elective 15 points	ENGR 201 15 points	Elective 15 points	Elective 15 points	Elective 15 points	Elective 15 points
		ENGR 291 0 points		ENGR 391 0 points		ENGR 491 0 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

*Students may chose from CGRA 151, ENGR 141, ENGR 142 or PHYS 100–199.

Key

Core	Part 2: Major	Part 2: Professional practice	Part 3: Work experience	Elective
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JOEL

ROBERSTON

Graduate, Bachelor of Engineering with
Honours in Electronic and Computer Systems

“I enjoy using problem-solving skills in engineering to create new devices and expand my understanding of physics and mathematics. All my courses have been packed with interesting and useful knowledge, including lots of practical learning. The Summer of Tech programme, sponsored by the University, helped me get a summer job as a software developer after my second year of study.”