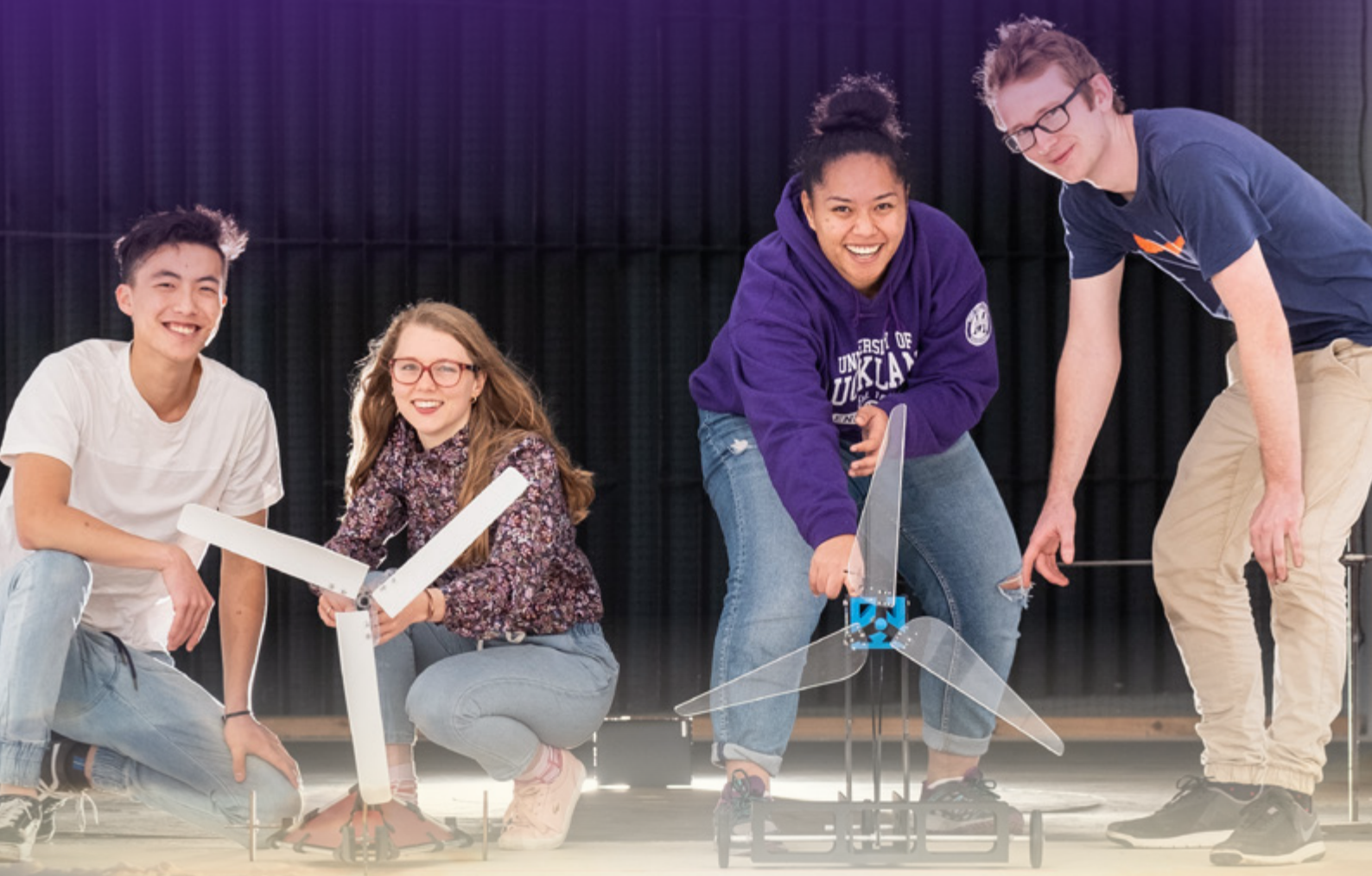
THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

Engineering

Undergraduate Prospectus 2022



No. 1
*New Zealand university**

No. 1
*Global Reputation***

No. 1
*in New Zealand for Employability****

Nau mai ki
Te Herenga Mātai Pūkaha
Welcome to the
Faculty of Engineering

With innovative and creative abilities, engineers are vital in our increasingly complex technological world. At New Zealand's leading engineering faculty+ , you'll be surrounded by people who are excited to push boundaries, improve lives, and learn from each other.

Our undergraduate degree has evolved a lot over the years, though we've never strayed away from its core purpose: ensuring that our graduates are primed to take on the future of work. Ten distinct specialisations are on offer – each of these will provoke you to master the advanced technologies we have on site and offer insights into the designs of our future environments.

You'll also experience our brand new, state-of-the-art engineering building. Located at the heart of Auckland city, our labs and facilities, spacious student areas, and Multidisciplinary Learning Spaces are all built with you in mind. Along with our roster of exceptional academic staff and student support, we'll provide you with the best possible foundations for success.

A degree in Engineering offers unparalleled opportunities to contribute to positive change, both locally and internationally. Our graduates navigate global socio-economic challenges and technical complexities with creativity, empathy, and passion – we hope to see you do the same.

On behalf of our faculty, I invite you to join our community of learning/whakauru mai ki tō mātou kāhui ako. Together, we can make a positive difference in our world.

PROFESSOR GERARD ROWE
Acting Dean of Engineering
The University of Auckland

+ QS World University Rankings by Subject 2020

Cover attributions

**QS World University Rankings 2021*
***QS World Rankings Academic and Employer Reputation 2020*
****QS Graduate Employability Rankings 2019*

Our undergraduate programme

Bachelor of Engineering (Honours)

Full-time: 4 years

Points per degree: 480

Taught at: City Campus

Application closing date: 8 December 2021

Classes start: 28 February 2022 and 18 July 2022

The BE(Hons) degree at the University of Auckland is a four-year programme that can lead to Chartered Professional Engineer status after graduation and suitable work experience. It consists of 480 points, usually divided into four 120-point parts (each equivalent to one year of study).

Part I is a common first year. You gain exposure to each of our ten specialisations and study a broad base of engineering and professional fundamentals.

At the end of Part I, you will be invited to select the discipline in which you wish to specialise for the remainder of your degree. We offer ten different specialisations. Each one has a limited number of places, so admission into your preferred specialisation is based on your academic results in Part I.

Parts II, III and IV are customised over the following three years according to your area of specialisation. You will study a common core of mathematical modelling, technical communication and professional development, in addition to specialist subjects relevant to your chosen field. You will also have opportunities to choose elective courses, allowing you to further specialise in topics that interest you most.

Throughout your degree, your courses will involve a mixture of lectures, tutorials, traditional assignments and exams, as well as laboratories, field trips, practical work, research projects and presentations.

Conjoint programmes

Full-time: 5 years, or 6 years with an LLB or BAdvSci(Hons), and 7 years with an LLB(Hons)

Points for BE(Hons): 420 points

Conjoint combinations: Arts, Commerce, Design, Fine Arts, Global Studies, Law, Law (Honours), Music, Property, Science, Advanced Science (Honours)

Points for other degree: 465 points for LLB(Hons), 405 points for LLB, 375 for BAdvSci(Hons), and 255 points for all other conjoints

Conjoint programmes enable you to complete a BE(Hons) and another degree more quickly than if you were to undertake them separately. They can be an excellent choice if you know that the other degree component will be beneficial in your proposed career, or if you are a capable student with skills in various areas.

The workload for a conjoint programme is higher than that of a single degree (usually 135 points per year, compared with 120 points per year for a single degree). The BE(Hons) programme alone is considered to have a high workload, so conjoint students must be prepared for an even greater challenge.

Conjoint programmes have higher entry requirements and may be subject to faculty approval. They can be structured in several ways, and planning your timetable can be complex, so please contact your faculty Student Centres if you need extra help.

Before you apply, see **www.auckland.ac.nz/conjoints**.

Sample BE(Hons) degree structure

Part I	**CHEMMAT 121** Materials Science	**ELECTENG 101** Electrical and Digital Systems	**ENGGEN 115** Principles of Engineering Design	**ENGGEN 121** Engineering Mechanics	**ENGGEN 131** Introduction to Engineering Computation and Software Development	**ENGGEN 140** Energy and Society	**ENGSCI 111** Mathematical Modelling 1	General Education	**ENGGEN 199** English Language Competency
Part II	**ENGGEN 204** Professional Skills and Communication	**ENGSCI 211** Mathematical Modelling 2	Specialisation course	Specialisation course	Specialisation course	Specialisation course	Specialisation course	Specialisation course	**ENGGEN 299** Workshop Practice
Part III	**ENGGEN 303** Managing Projects and Innovation	**ENGSCI 311** Mathematical Modelling 3	Specialisation course	Specialisation course	Specialisation course	Specialisation course	Specialisation course	Elective	**ENGGEN 499** Practical Work
Part IV	**ENGGEN 403** Managing a Business	Specialisation course	Research Project		Elective	Elective	Elective	Elective	

Common core courses *Specialisation courses* *Elective courses* *General Education courses* *Part IV research project* *Compulsory degree components*

All successful applicants will gain entry into the BE(Hons) programme. The BE(Hons) degree is awarded to those students who achieve a sufficiently high Grade Point Average (GPA) in Parts II, III and IV. Students who successfully complete the programme, but do not achieve a sufficiently high GPA to be awarded the Honours degree, will be awarded the BE degree.

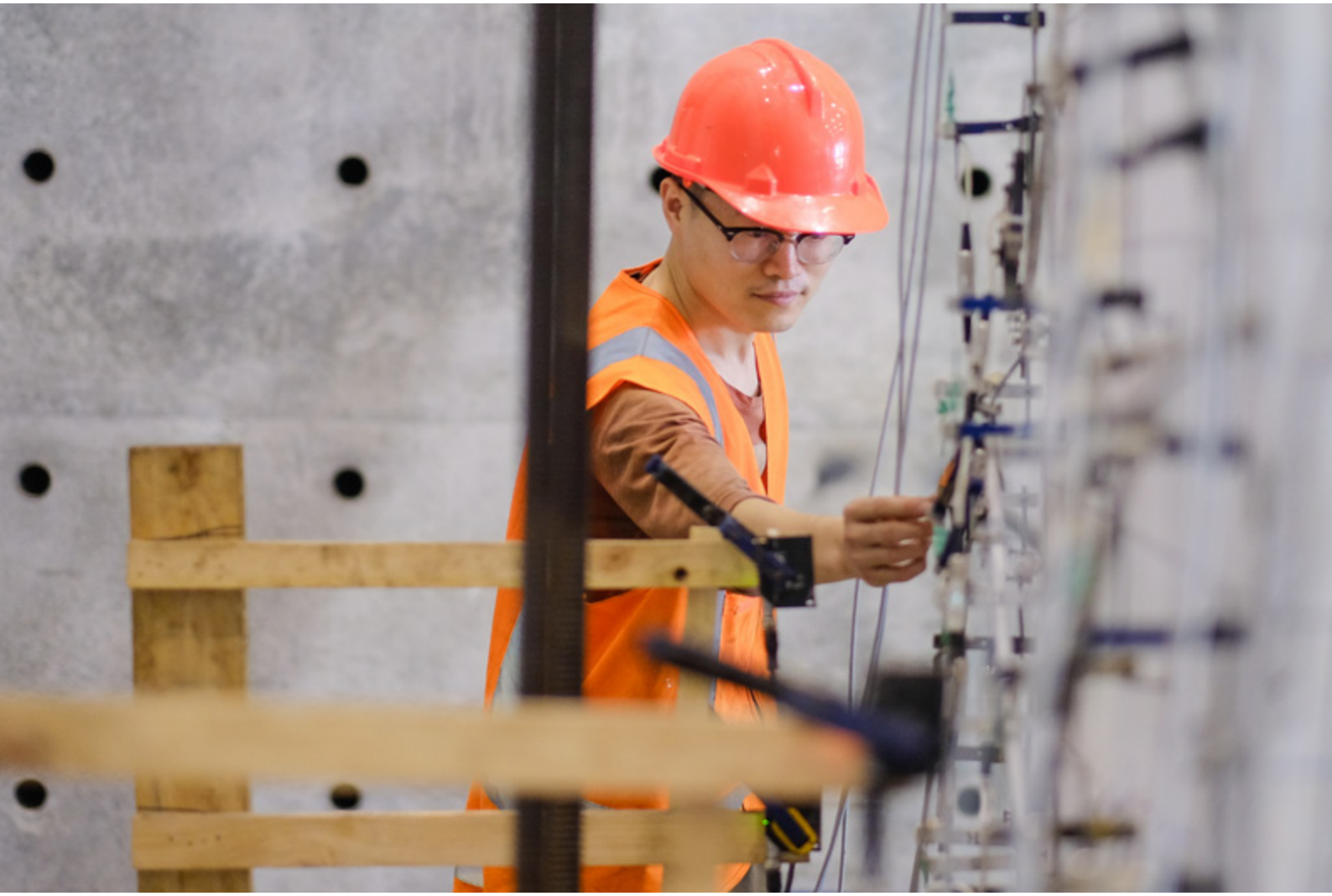
Practical work

There are two compulsory practical work requirements of the BE(Hons) degree. In Part II, you will need to complete a 40-hour workshop practice course. You are also required to gain at least 800 hours of practical work experience throughout your degree. This will involve exposure to general trade and sub-professional skills relevant to your Engineering specialisation, ensuring you're ready for the workforce by the time you graduate.

General Education

General Education courses are a distinctive feature of the University of Auckland's bachelors degrees. They are designed to broaden your education and give you a chance to try a course outside your degree. As a BE(Hons) student, you must pass one General Education course (15 points) in Part I. Special arrangements may apply if you transfer from another tertiary institution with credit. For more information, visit **www.auckland.ac.nz/generaleducation**

Our engineering specialisations



Our newest specialisation responds to the increasing demand for professionals who can tackle the complex structural and geotechnical nuances of civil engineering. Structural Engineering is especially relevant to New Zealand's unique seismic setting. Our curriculum aligns with international best practice, reflects the expectations of key professional bodies and focuses on the theoretical foundations needed by structural engineers. This ensures that your BE(Hons) in Structural Engineering from the University of Auckland will be comparable to a tertiary programme in this specialisation offered by leading institutions worldwide.

Structural Engineering

Structural engineers are essential to our built environments – from literally the ground up – with their understanding of geotechnical site conditions, ground response to seismic action, materials for construction, and loading conditions. They work on the design, analysis, construction and maintenance of the structural elements in domestic, industrial and commercial buildings, including skyscrapers, bridges and other infrastructure. Their specific technical knowledge additionally enables them to conduct design for environments prone to seismic activity.

A major benefit of this specialisation is the direct link between your study and employment. Structural engineers are in very high demand, with opportunities being available to skilled professionals both in Aotearoa and overseas. It's also a field that visibly contributes to public good. As many parts of the world are increasingly susceptible to natural disasters, the structural engineering profession is especially important to the safety of our people and communities.

You'll also be learning from exceptional academics, many of whom are well-established researchers in the field. Their expertise contributes to our reputation as the country's top tertiary institute for Civil and Structural Engineering, ranking at 39th in the world according to the 2020 QS World University Rankings by Subject.

Civil Engineering

Civil engineers work in one of the oldest engineering disciplines and they make modern life possible. They work on the planning, design, construction and maintenance of infrastructure such as motorways, bridges, tunnels and dams. The breadth of civil engineering means that you will explore topics that include transportation, geotechnical, structural and hydraulic engineering, as well as construction and project management. There is also a growing connection between the disciplines of civil and environmental engineering, which you will also be exposed to, as professionals become more concerned with solutions that help mitigate further harm to our planet.

Career opportunities

The demand for civil and environmental engineers will soon exceed supply as cities continue to grow, ageing infrastructure needs replacing and the need to rectify human harm to the environment becomes critical. You will find opportunities in state-owned enterprises, in regional and district councils, and as an engineering contractor or consultant in the private sector. A number of our graduates have progressed into the top echelons of businesses around the world.

"There are plenty of chances in Civil Engineering to observe what you have learnt in action in real life, so there's a great deal of immediate relevance.

"This is my second time at uni. I did a BSc/BMus the first time, and went to teach at a secondary school in Auckland. I met some seriously inspirational kids then, which made me realise that I was passionate about people, and using science to solve problems in our communities – I felt like it was the right time to come back to study.

"It's also the obvious pathway to a career in infrastructure – I hope to work as a transportation engineer after I graduate, but am open to all options at this stage.

"The facilities here are fantastic, and there are lots of opportunities to meet and work with like-minded people as we're the Engineering specialisation with the largest cohort. I'm also on the Women in Engineering Network and Engineering Without Borders committees, which can be hard work, but they've led to good friendships.

"I grew up in Auckland's North Shore, have worked in South Auckland, and now live centrally. Auckland isn't perfect, but there are a lot of great things about it. It's a really exciting place to live in terms of engineering – there's a lot of development happening regularly.

"Auckland is also extremely diverse and there are lots of things to do. I'm a classical singer and love to go to performances and the theatre, and there's a lot on offer here. The city should be really proud of its arts scene, and there are beautiful beaches and walks nearby. Things are very different in the workforce, so coming back to uni has been very refreshing – I'd recommend finding ways to enjoy yourself, find new experiences, and appreciate all the opportunities!"

Dilys Fong

Graduate: Bachelor of Engineering (Honours) in Civil Engineering

"The opportunities here helped me unleash my potential, and I feel empowered to make a difference. The University has one of the best entrepreneurial environments in the world, including its own maker space, free for anyone to use, so who knows what's possible even before I graduate!

"I've been a STEM fanatic my entire life, so my mind and heart were set on Biomedical Engineering even before I set foot on campus. It was the most intellectually fascinating subject I had ever come across. I saw it as a testament to a life of continuous learning for the betterment of humanity, melding the human body and machine together to not only improve the lives of millions across the world but also to transcend our physical and biological capabilities with mind-bending technologies. Who doesn't want to be a part of that?

"What I love about this specialisation is getting to take courses from various disciplines, from neurobiology and programming to materials chemistry and computer graphics. For a long time, I thought Biomedical Engineering was going to lead me into building medical devices or prosthetics but it's a lot more than that. I get to integrate seemingly unrelated concepts in new and exciting ways. I've learned that there's a whole host of 'sub-specialisations' within the specialisation itself.

"Engineering here is widely known for its family-like environment, and you will never feel alone when you can make friends at hundreds of student-run clubs. There is also personalised support from caring staff, and the students want to see each other succeed at university and beyond. Our lecturers provide valuable study resources and they are always happy to answer any questions."

Nicholas Kondal

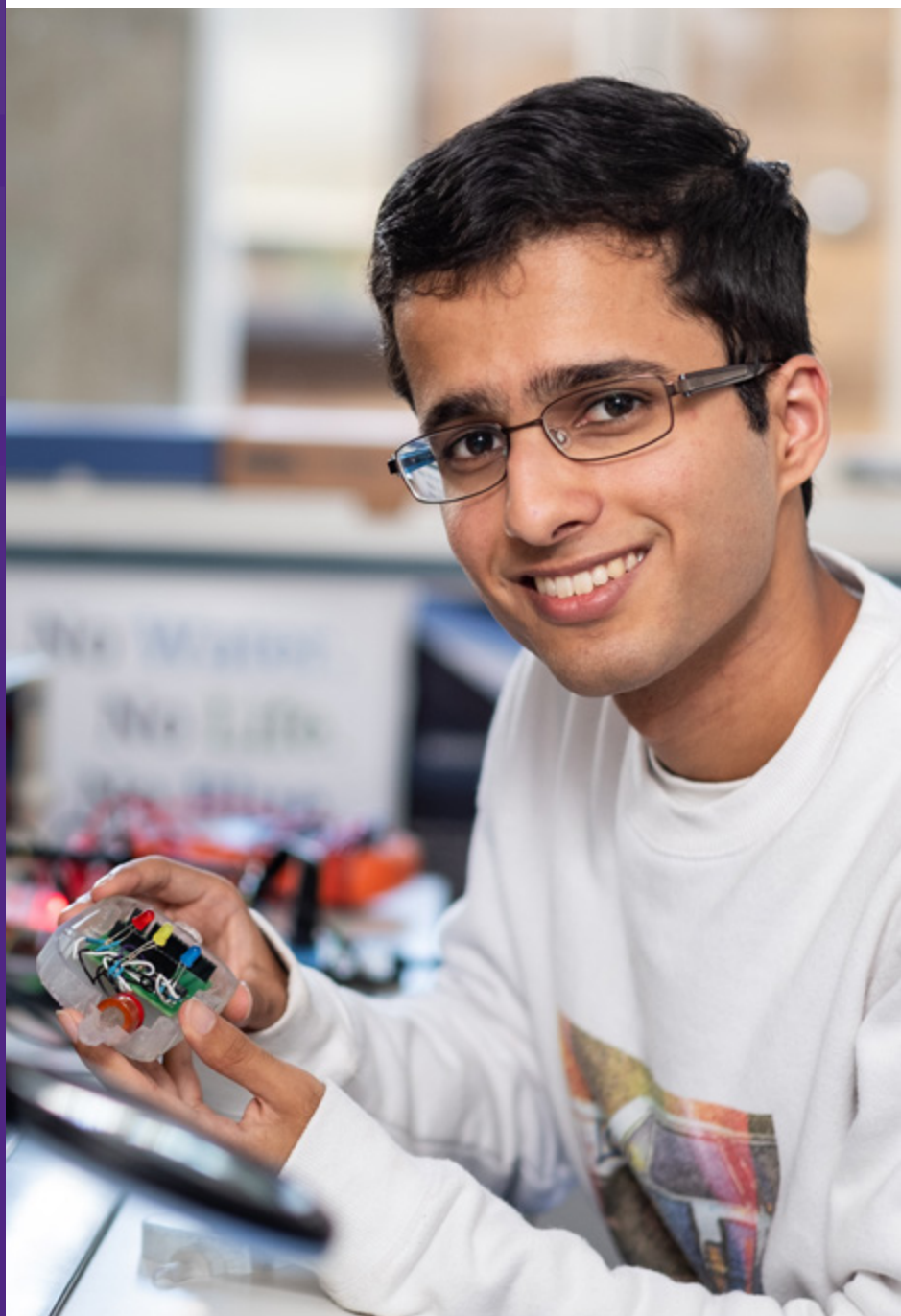
Conjoint student: Bachelor of Engineering (Honours) in Biomedical Engineering and Bachelor of Science

Biomedical Engineering

Biomedical engineers combine engineering, medicine, and biology to resolve challenges in the healthcare industry. They respond to challenging problems, and design medical solutions for more effective treatment and quicker recovery. It is a field of rapid diversification, and as the role of technology in healthcare becomes more prominent, biomedical engineers find themselves at the forefront of real-world, life-changing outcomes.

Career opportunities

Biomedical engineers often gain employment in biomedical companies, research facilities, hospitals and government regulatory agencies. They design medical devices, prostheses or implants, develop drugs or drug delivery systems, improve sports and injury assessment, and work in medical IT. As some of the most versatile professionals in the field, biomedical engineers can also be found in fields like software development, electronics, consulting, financial modelling, and the food/meat/wool industries.



"I got into Engineering Science because it has a little bit of everything and I didn't like the feeling of just being a specialist in one thing. It involves making different decisions and definitely complements the Commerce side of my degree well.

"For me, the biggest appeal of engineering has always been the broader picture. When you're doing work and obsessing over details like coding, it's always about flow and effects – you never quite know if your work as a student has impact or even if it'll be applicable or if you'll see half the stuff you're learning again, but we're acquiring these skills and becoming self-sufficient; we'd be assets in the workforce. There are transferrable qualities and you build a lot of resilience by learning difficult concepts.

"One of the best parts about Engineering Science is the Part II field trip. It's a lot of fun – we went to Rotorua for a few days to go on site visits. These included a geothermal plant to learn about their systems and processes, and we got to understand their logistics and scheduling of staff, which looks really dry but has huge implications at the human level.

"In hindsight, I really chose Engineering not because of the specific subjects, but because of what qualities I would gain. I knew it was going to be tough, so if I survived, that must say something about my character. Thinking back about brochures from the past, I never saw myself represented in those, which is another reason why I do it. Growing up, you don't often think of anything outside of yourself or the issues and impacts you can have beyond what's immediately in front of you – I'm always driven by the next step and what's bigger than this."

Lupesina Koro

Lufilufi, and Salelologa, Samoa; Atafu, Tokelau

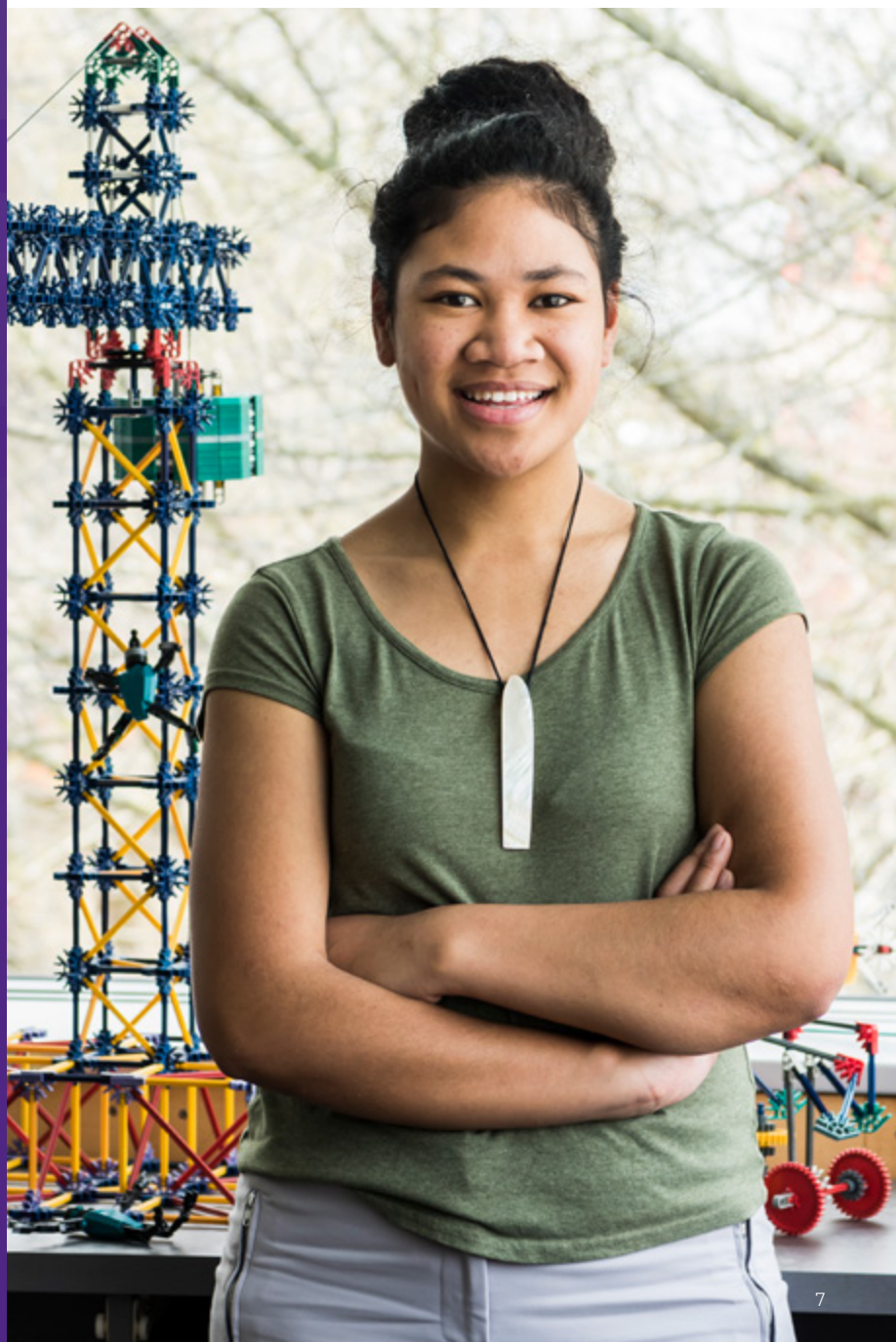
Conjoint student: Bachelor of Engineering (Honours) in Engineering Science and Bachelor of Commerce

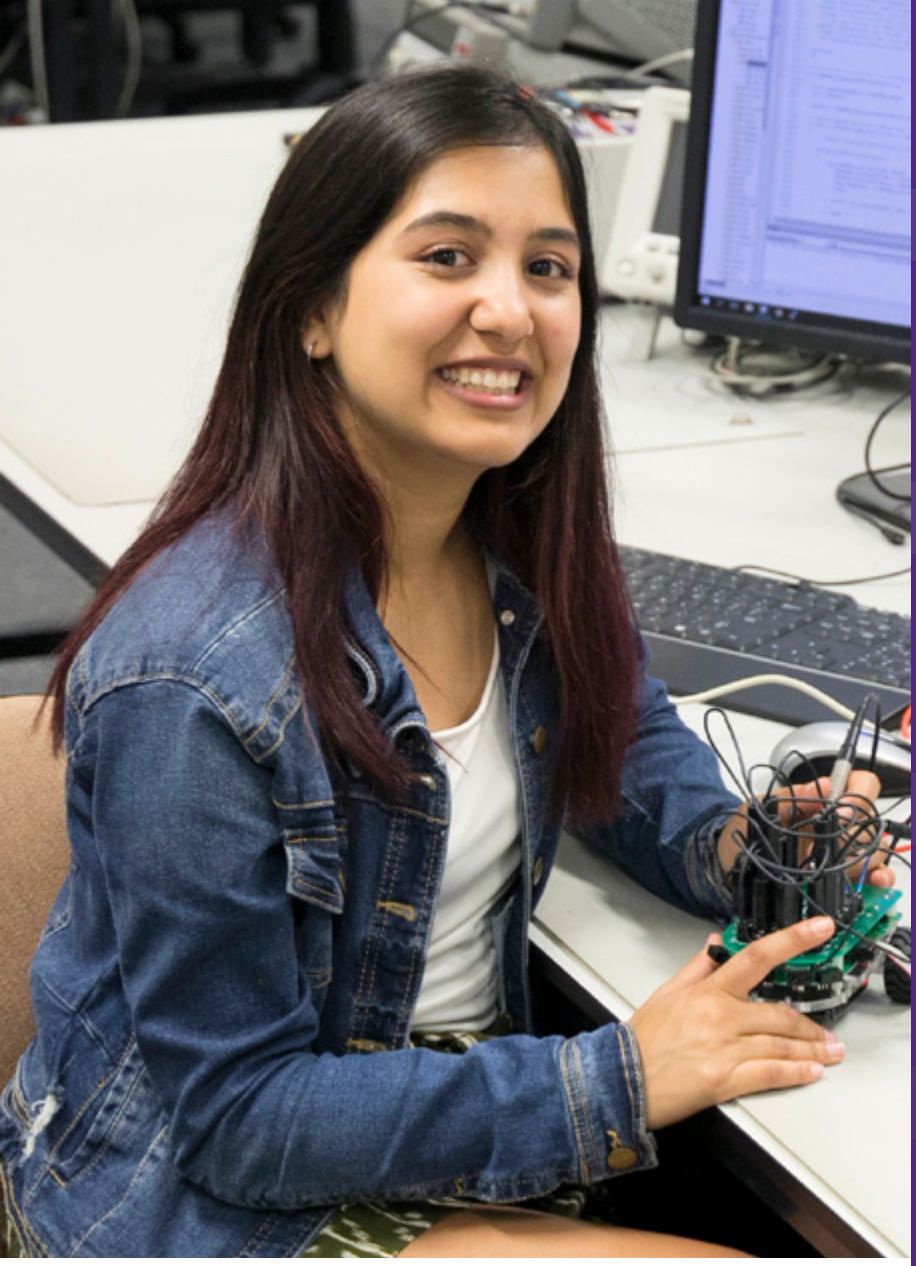
Engineering Science

Engineering scientists are problem solvers committed to the science of "better". They use their intellect and advanced mathematical skills to design ways to optimise and improve systems. How can a forest be managed to make a profit while still remaining environmentally friendly? How can a sail be designed to work in low wind conditions? What prices should be charged for airline tickets to maximise the revenue from a given flight? These are all questions an engineering scientist would relish.

Career opportunities

The diverse range of options available throughout your degree will directly contribute to your professional versatility. You might end up developing software, modelling production processes for a large manufacturer, or perhaps undertake a management position with a bank. Our graduates can be found in leading New Zealand companies like Fonterra, Air New Zealand, and Meridian Energy, in government organisations including NIWA and Transpower, and consultancy firms such as Beca and Maunsell.





Computer Systems Engineering

Computer Systems Engineering now pervades almost every aspect of our world. It constitutes the core of controllers and components of wireless communication systems, home automation systems, appliances, automobiles, factory processes, mechatronics, instrumentation, embedded systems and nano-systems. Computer Systems Engineering is a crucial discipline that pushes us to consider practical engineering problems with computer-based solutions, often by embedding a computer system into a complex operation that can sense, problem-solve and act in the real world.

Career opportunities

As innovative design and product development continue at pace, so does the demand for qualified engineers. As a graduate, you will find opportunities in multinational computer companies, consultancy firms, the telecommunications industry, and in the research and development teams of companies in a multitude of sectors. You might extend your Part IV research project, develop a new technology and form your own start-up company.

"I've always been super interested in technology and I knew that Engineering was a degree that would let me explore and learn more about it. Computer Systems Engineering is so relevant today. With smart devices everywhere we go, I knew I would get the opportunity to create and work with today's latest technologies.

"I'll also enable positive change using the knowledge I've gained, while continuing to learn along the way. My goal is to see my contributions have a meaningful impact on someone, somewhere in the world.

"Our projects are probably the biggest highlight of this programme. We've got to work on electrical circuits, create video games by using only hardware and digital logic, and even tackled software projects like creating a social network website! My personal favourite project so far was developing a line-following robot, it was the best feeling to see our team's robot navigate through the maze. Nothing compares to the feeling of seeing all your hard work pay off!

"Apart from choosing Computer Systems Engineering, I would say that one of the best decisions I made here was to join more clubs and societies. Not only do extra-curricular activities expand your social circle, but there is so much more to being at university than just your projects and assignments.

"I am part of the Women in Engineering Network and the Engineering Revue, where I've made so many friends and connections. There are also ways you can volunteer in the community, so I've also been involved with Robogals – we've held workshops in schools and libraries to show young girls how to program robots and explore STEM through activities. It's a lot of fun working alongside other students who believe in the cause."

Salina Dhungel

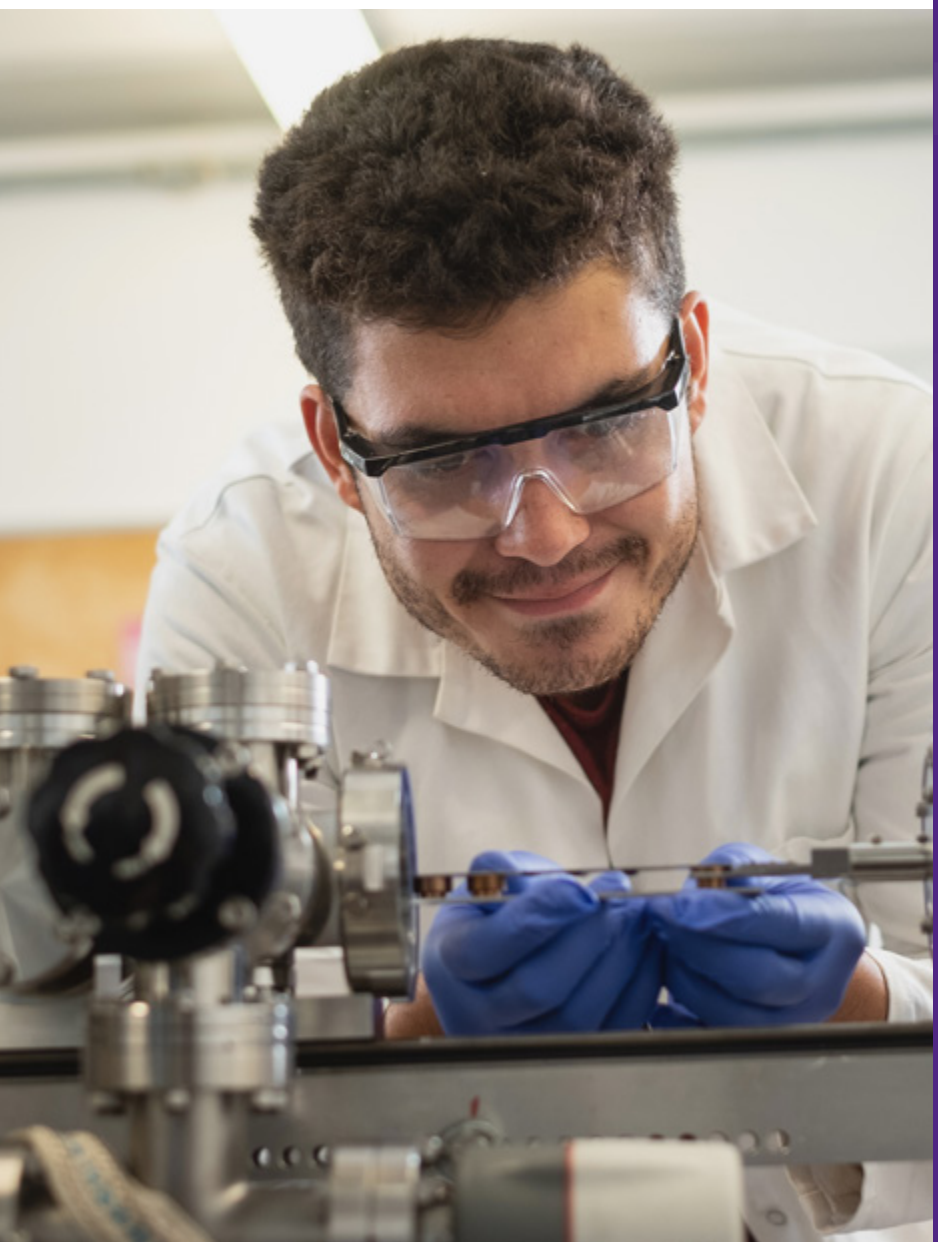
Student: Bachelor of Engineering (Honours) in Computer Systems Engineering

Chemical and Materials Engineering

Do you wonder how products like petrol, plastic bottles, and synthetic polyester are produced from oil? Or are you more interested in developing new, sustainable replacements for these everyday items? These topics fall under Chemical and Materials Engineering, a discipline that involves understanding how to chemically or physically alter a substrate in order to produce something useful. As "big picture" professionals, these engineers are often responsible for the overall design, operation and quality of giant-scale processes.

Career opportunities

Major industries employing chemical and materials engineers include dairy and food, pharmaceuticals, paper and pulp, petrochemicals, energy processing and production, construction and cement, timber, water treatment, resource development and management, electronics, and mineral processing industries such as aluminium and steel production. As sustainable practices become increasingly critical, chemical and materials engineers will also be required to re-evaluate and re-design many of the fundamental products and processes that these industries have been built upon.



"I was interested in engineering from a young age. I always wanted to know how things worked. Chemical and Materials Engineering allowed me to discover this from an atomic and microscopic point of view. I learned the way in which materials are created and processed and the reasons different materials have the properties that they do.

"We are taught by industry leaders with decades of experience. Our lecturers aren't afraid of doing things differently and like to have relevant, intelligent class discussions rather than just talking through a set of slides. I enjoyed my Part IV project, as I got to pitch my own project which brought with it its own set of challenges. It was very self-driven, which I loved. I want to be a leader of my own company one day so being able to practice leadership by leading myself was very rewarding for me.

"What I really enjoy about uni life is the sense of community. City campus really is like its own little city made up of like-minded individuals. Whatever your interest may be, there is something for you. In the very rare instance that there is nothing that piques your interest you can even establish a new club.

"I've also always been interested in business and how businesses can effect change. I didn't always want to be just an engineer or just a business person – I wanted to be something unique. It was a no brainer to pick a conjoint degree. To be able to take the best of both degrees and use this to shape my views and aspirations has been greatly rewarding. Having the right circumstances to follow your dreams is very rare so I feel honoured to be in this position."

Marc Lewis

Iwi: Ngāti Hinehika, Ngāti Kahungunu

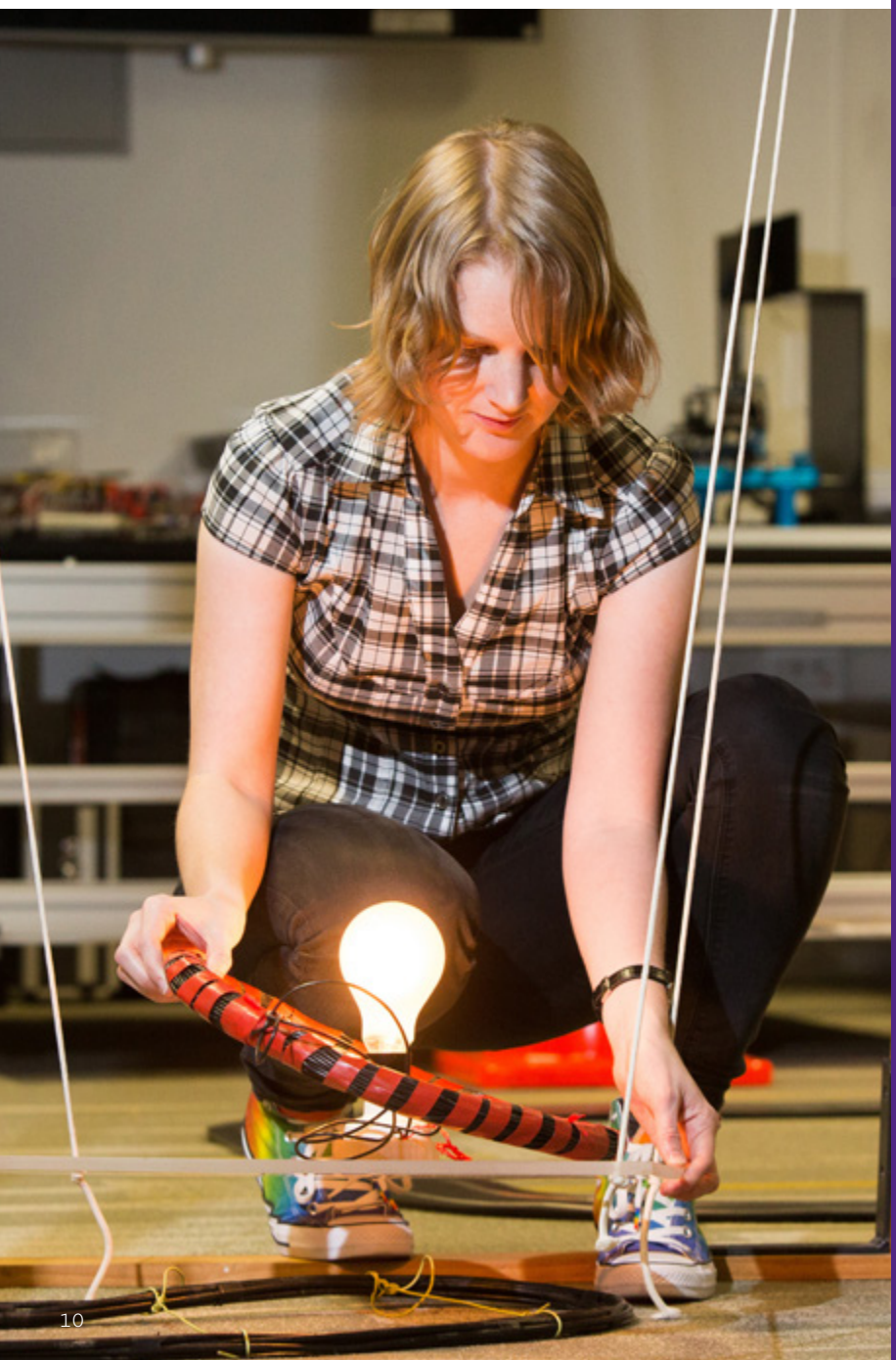
Conjoint student: Bachelor of Engineering (Honours) in Chemical and Materials Engineering and Bachelor of Commerce

Electrical and Electronic Engineering

Modern society is highly dependent on reliable power, communications and electronic systems. Electrical and electronic engineers design the equipment and systems that provide these essential services. The discipline encompasses a range of exciting and diverse fields, from heavy electrical power generation, to sophisticated medical electronics, computer modelling, electromagnetics, information technology and the global telecommunications network. We will have electrical and electronic engineers to thank when new forms of green electricity are developed and electric vehicles replace our fossil-fuel-powered fleet.

Career opportunities

This engineering discipline changes so rapidly that it may be difficult to envision the types of technology you will be working on by the time you graduate – they may not even be invented yet! Today, our graduates are employed in roles relating to communications, wireless computing technologies, electronics, instrumentation, power electronics and motor-control. Opportunities also exist in processing industries such as timber, pulp and paper, steel, aluminium, meat and dairy.



"A love for all things hardware and software brought me to Electrical Engineering. I enjoy figuring out how things work, right down to the electron level. I was aiming for a career in the aerospace or automotive industry because I want to use my knowledge of software and machine learning to make hardware smarter and more sustainable.

"Electrical and Electronic Engineering is a fantastic programme as it is very project-focused. I've gained invaluable experience in taking a problem and designing a solution with my own knowledge. This really prepares you for the real world and shows employers that you are an efficient problem-solver.

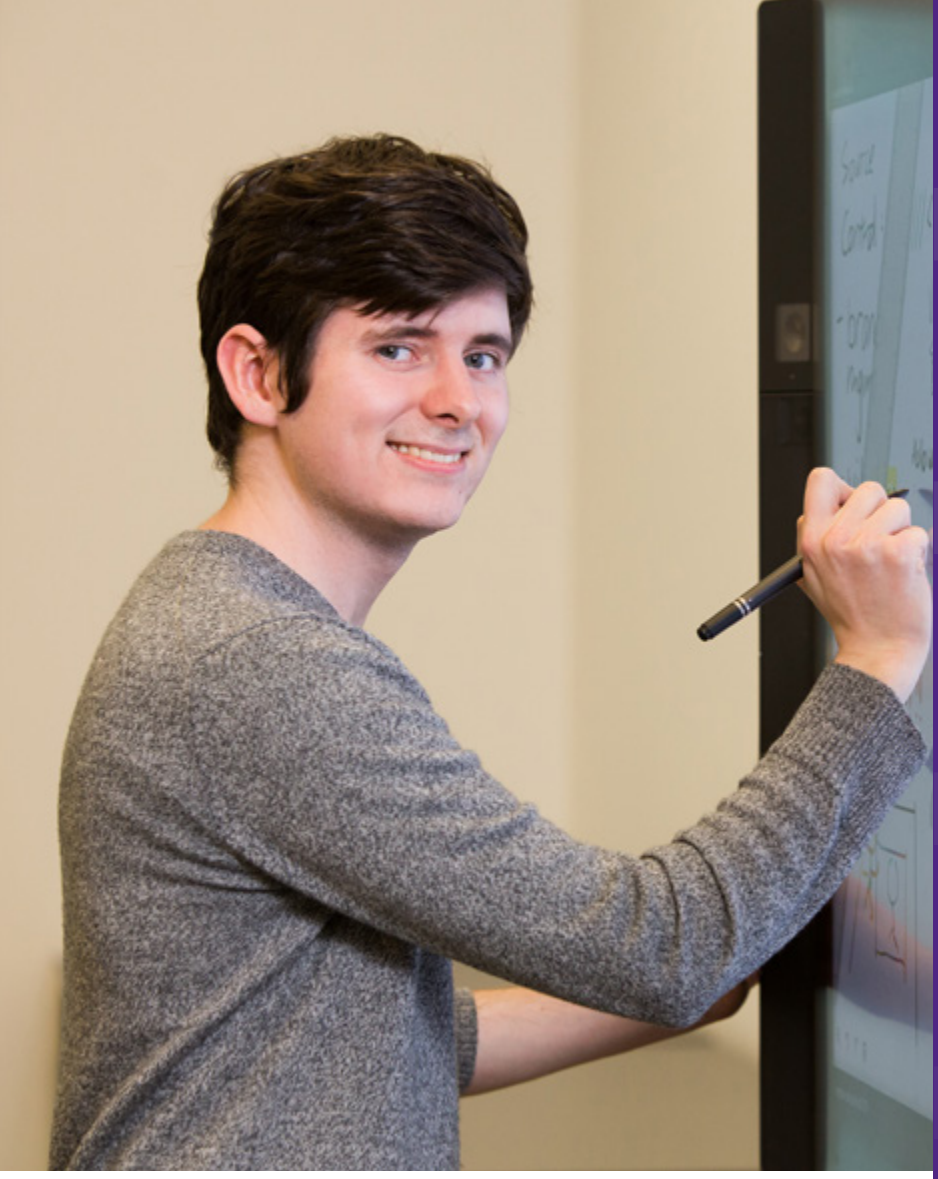
"One of the most valuable things I learned was how to deal with ambiguity. So often in engineering, we are faced with poorly-defined problems and have to come up with a solution, even if we don't have specific knowledge of the domain. My degree has given me this vital skill and increased my overall confidence to take on the workforce.

"The University of Auckland has students from all over the world. I've learnt about so many different cultures, degrees and backgrounds. Your classmates get you through it all because they know exactly what you're going through, and the lecturers want you to succeed to the best of your potential.

"Having the campus located in the city centre is a great plus. I really enjoy heading out to local cafes with my classmates in between lectures. On a sunny day, Albert Park is a nice place to relax and get some of that much-needed vitamin D. I think the friends I've made, including lecturers and graduate students, have made my university experience truly great and I don't think I could have gotten through it without them."

Emily Melhuish

Graduate: Bachelor of Engineering (Honours) in Electrical and Electronic Engineering



Software Engineering

Software Engineering is behind many of the things we now take for granted – internet banking, online shopping, and mobile payments. It is the apps on your smart phone, the games on your computer, and the cloud storage you depend on to back up your devices. This area of engineering is being propelled by widespread demand for faultless software support. The creative possibilities literally stretch as far as your imagination!

Career opportunities

As infrastructure, government agencies, businesses, and individuals become increasingly rely on intuitive, dependable, cloud-based solutions, software engineers are emerging as the newest generation of IT workforce leaders. As a graduate, you could end up in virtually any company, managing their information storage and sharing technologies. You might choose to join a dedicated software consultancy firm, or work your way up to management. Or, you might extend your Part IV project with postgraduate research, and use this to kick-start your very own start-up company.

"Engineering was always an interest of mine at school, and hearing about software engineering and its job prospects had always been very enticing. I also chose Engineering in particular because I liked being able to get real practical experience while studying. This requirement that we all gain practical work hours has been great, as it makes me feel that I can be a good engineer when I graduate.

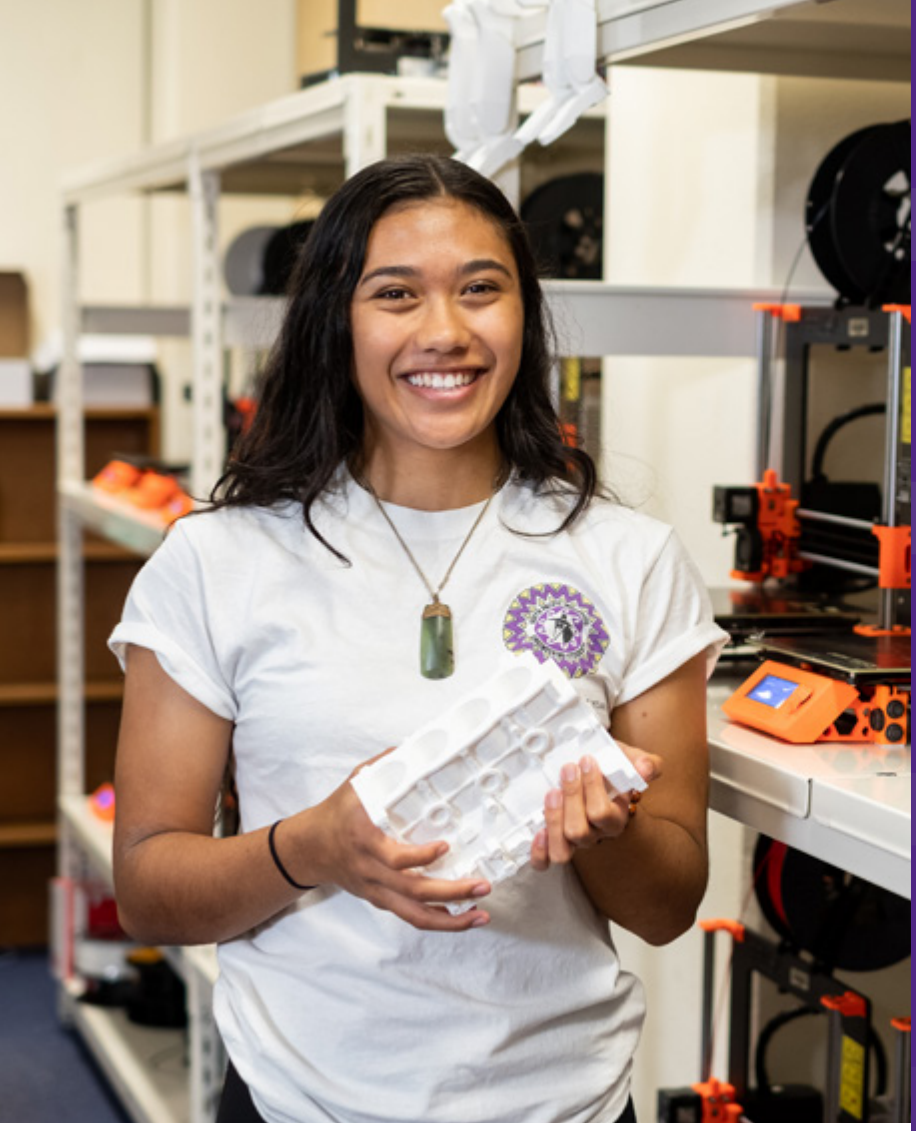
"The faculty here is amazing – our lecturers focus on teaching concepts that aren't just from a textbook. Talking to, and learning from them built confidence in my coding abilities and continued to kindle my passion for software engineering. They are definitely inspiring.

"There's also a very strong student community. Peers from the year above will help younger students and organise events through the Software Engineering Students Association (SESA). We're a relatively small and welcoming community; we understand that everyone goes through the same challenges, which fosters close friendships and provides a sense of satisfaction as your skills develop so extensively. You're able to create real products and see your skills improve in such a short time.

"My aim was to go out into the workforce after my undergraduate degree and work my way up to be a Software Architect or Project Lead. I had the opportunity to complete an internship at Microsoft in the US, so I'm hoping to continue developing my industry skills after I graduate."

Dylan Hall

Graduate: Bachelor of Engineering (Honours) in Software Engineering



Mechanical Engineering

Mechanical engineers use science and technology to design and produce mechanical devices, machinery and systems, such as robots, wind turbines and rockets. Their work spans a range of scales, from nanotechnologies to the large-scale industrial machinery and processes seen, for example, in paper mills or car assembly plants. Mechanical engineers also deal with thermodynamics and fluid dynamics, with the understanding of how to efficiently use energy in processes. These are applicable to designing heating systems for hospitals or refrigeration plants, or making sure aircraft and yachts move efficiently.

Career opportunities

As a graduate, you might pursue opportunities in the manufacturing or transport industries, or in major primary process plants that produce things like wood pulp, dairy products, meat, steel, petroleum and electricity. Many of our graduates enjoy the variety involved in consultative engineering, where they are commissioned by companies to plan, design and implement a range of projects often confined by challenging and industry-specific parameters.

"I originally wanted to study Architecture because I really enjoyed Graphic Design in high school, but my mum suggested that I choose Engineering by telling me that engineers will have the final say on whether an architect's final designs can be built or not.

"At Open Day, I was still considering both options and was told I could always switch if I didn't enjoy Engineering after my first year, which really helped me make my decision.

"I applied through MAPTES, was accepted, and in my first year, I considered pursuing Civil Engineering to become a structural engineer. It turned out to be a lot tougher than I originally expected, but something told me to not give up and to keep trying. It may have been my pride. Also, you get to take a variety of general Engineering papers in your first year so you get exposed to everything at once. I figured I'd do a lot better once I chose a specialisation and could start taking the papers I was really passionate about.

"I got support and attended a development workshop that aims to help you to learn which specialisation you would be good at and enjoy, and eventually decided it would be Mechanical Engineering. Their papers are practical and applicable to everyday stuff. I'm open with where I'll end up, though hopefully it will be along the manufacturing, design, or mechanics of materials pathways.

"I'm a member of SPIES (South Pacific Indigenous Engineering Students) and NTM (Ngā Tauira Māori). It's helpful being surrounded by like-minded people with similar timetables and interests. I've also spent a lot of time doing sports. I've represented Engineering, the University, and New Zealand in Hawaii for the Queen Lili'uokalani long distance regatta. Every year we lose some paddlers and gain new ones. Some have never tried it before, but every year they make me proud and I can't wait to paddle again!"

Georgia Naera

Iwi: Te Arawa (Ngāti Whakaue, Ngāti Uenukukopako), Tainui (Ngāti Maniapoto), Ngāpuhi (Ngāti Hine)

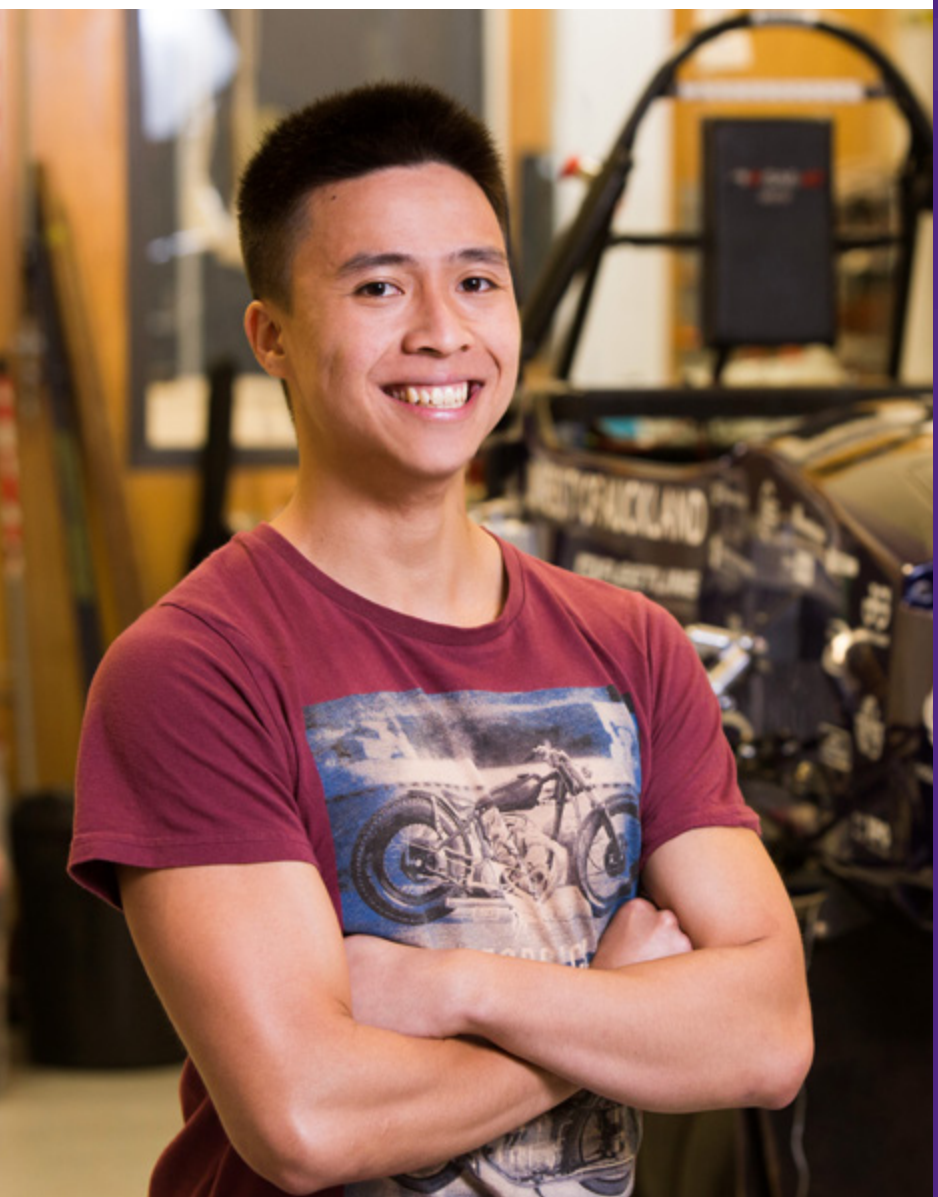
Student: Bachelor of Engineering (Honours) in Mechanical Engineering

Mechatronics Engineering

Mechatronics Engineering integrates specialist knowledge in mechanics, electronics and computer systems to design and develop automated systems, such as chassis-stabilising systems, anti-lock brakes, engine control units, disk drives, cameras, service and surgical robots and medical devices. All of these systems are largely mechanical in nature, but could not function without their essential electronic and computer control system components. As "jacks of all trades", mechatronics engineers are often generalists rather than specialists, with a versatility that is highly valued in the workforce.

Career opportunities

This specialisation is fully in line with the modern world's desire for a high-tech, knowledge-based economy. As society moves toward "smart" homes, cities and grids, mechatronics engineers will be in high demand. Our graduates can be found in a wide range of jobs that involve the design and improvement of high-tech products, such as home appliances, medical devices, machine tools, and processes related to precision agriculture and remote sensing.



"Mechatronics intrigued me in terms of the broad range of knowledge and skills that I can gain. The fact that I get to have the opportunity to apply these technical skillsets from multiple engineering disciplines is very fulfilling. For me, it is essentially a specialisation that provides the foundations to design, create and innovate literally anything you want.

"I wanted to be part of a top-performing University that will give me a solid foundation of good work ethics and open up a variety of career opportunities. The University of Auckland was my first and only choice.

"I was part of the Warman project, which involved students designing and building a robot from scratch. It was a real highlight and a Mechatronics dream because it incorporated sensors, mechanical design, hardware programming, and lots of teamwork. My team's final design eventually represented the University of Auckland in the international Warman Competition in Sydney!

"I have always aspired to see what the world has to offer, so getting an opportunity to work overseas in a company like Holden or Google has always been a goal of mine. I'd always want to come back to New Zealand though, so I'm hoping that with knowledge and experience, I can improve our society here, the place that I call home.

"I enjoy the fact that the University provides a variety of opportunities to participate in activities outside of studies. I like to give new things a go, and have joined clubs dedicated to scuba diving, basketball, and the Auckland Program of Space Systems. I have met new friends, seen more of the country, and had memorable experiences. Beyond studying, I think taking the opportunities to enjoy university life is pretty important!"

Lawrence Pascual

Graduate: Bachelor of Engineering (Honours) in Mechatronics Engineering

Enabling your success

Our dedicated support services complement our culture of academic excellence. This allows us to maintain an environment that makes our people feel welcome and inspired.

Modern learning environments

Our newest engineering building is located at the heart of Auckland City, at our University's City Campus. It contains tailor-made spaces – including over 50 specialist research laboratories – across 11 floors to encourage multi-disciplinary teaching and learning.

International recognition

Nine of our engineering specialisations are accredited by Engineering New Zealand, a regulatory professional body and signatory to the Washington Accord. Engineering New Zealand accreditation makes your degree a recognised qualification in many countries overseas.

Combine your degrees

You can complete an Engineering degree alongside another specialist field from a different faculty by pursuing a conjoint degree.

Women in Engineering

Women are highly represented in our undergraduate student body, making up over 26% of our undergraduate cohort – one of the highest participation rates in tertiary-level engineering across Australia and New Zealand.

Innovation and entrepreneurship

We are ranked as the most innovative university in New Zealand*, and we are committed to building a culture of innovation and entrepreneurship, with high levels of connectivity between researchers and businesses.

Initiatives outside of study that engineering students have found success in include Velocity, our University's entrepreneurial programme, and the Auckland Programme for Space Systems. The latter is a satellite mission programme open to undergraduate students. It is also a part of our faculty's mission to enrich Aotearoa New Zealand's space industry.

Practical experience

You'll gain relevant experience in the workplace alongside industry professionals, as you carry out the 800 hours' practical work required over the course of your degree.

Strong career and employment outcomes

The University of Auckland has a QS 5 Star PLUS rating for excellence in eight categories, including employability. We are the leading university in New Zealand for graduate employability.**

Research excellence

We have the largest number of top-rated researchers, and the highest level of research income of any university in New Zealand, making us well-equipped with the best knowledge our country can offer. You'll have access to well-established facilities such as the renowned Auckland Bioengineering Institute, QuakeCoRE, Civil Structures Testing Lab, the Boundary Layer Wind Tunnel, Centre for Automation and Robotic Engineering Science, and more. This opens up opportunities, especially if you're already thinking ahead to a future in research or postgraduate study.

Competitive admission

We have a guaranteed entry scheme for high-performing secondary school students so you'll be studying alongside the best. Limited places are also available under our Targeted Admission Schemes for eligible students.

Unique specialisations

We are the only university in New Zealand to offer undergraduate specialisations in Engineering Science, Biomedical Engineering, and the combination of Chemical and Materials Engineering.

** Reuters: Asia Pacific's Most Innovative Universities 2019*

*** QS Graduate Employability Rankings 2019*

Student life

University can be both a challenging and exciting experience. The Faculty of Engineering is dedicated to providing a relaxed and supportive atmosphere for our students, so academic and pastoral support are always available. Events are held throughout the year, and there are many student groups, clubs and associations to get involved with.

Part I Assistance Centre

First-year students can receive academic assistance from high-achieving students weekly during Semesters One and Two. These mentors are trained and maintain close contact with our course coordinators throughout the semester. This service is also provided for Engineering students living at O'Rorke Hall.

In-house support

The Student Engagement and Development team supports you academically, personally and professionally. They are there from Orientation through to employment, and provide academic help, pastoral services and links to key support services. These include health and counselling, Career Development and Employability Services and academic help. Reach out to us at **foe-engagement@auckland.ac.nz**

Tuākana Tutorial Programme

The Faculty of Engineering employs high-achieving Part II and Part III students to provide targeted tutorials in all core Part I Engineering courses. Academic support programmes are also provided for Māori and Pacific Engineering students.

Clubs and associations

We ensure that you have the spaces and opportunities to make new friends and enjoy the vibrant culture of student life. You may choose to join specific groups, such as the Women in Engineering Network (WEN), the South Pacific Indigenous Engineering Students Network (SPIES) and the Rainbow Engineering Network. Alternatively, there are plenty of clubs for different areas of interest, including the Engineering Revue, the University of Auckland Formula SAE Team, Engineers Without Borders, and more.

International students

We welcome applications from international students. If you seek admission to Part I of the BE(Hons) and have New Zealand secondary school qualifications, you will require the same guaranteed entry score as domestic students. If you apply for admission based on an overseas secondary school qualification you must meet admission, programme and undergraduate English language requirements. See **www.auckland.ac.nz/prioroverseasschoolstudy**

Scholarships

More than 40 Engineering undergraduate scholarships ranging from $1,000 to $7,500 have been graciously established by individuals, societies, businesses and industry bodies. For a full list of undergraduate scholarships and awards, visit **www.engineering.auckland.ac.nz/scholarships**

Joining us

University Entrance Standard

To apply for admission based on secondary school qualifications, you need to meet the University Entrance Standard established by Universities New Zealand. For details please visit **www.auckland.ac.nz/entry-requirements**

Programme requirements

As well as achieving University Entrance, you must also meet entry requirements for the BE(Hons) programme.

Guaranteed entry requirements			
Programme	**NCEA (Level 3)**	**CIE**	**IB**
Bachelor of Engineering (Honours)	260 with 17 external Level 3 credits in Calculus and 16 external Level 3 credits in Physics	310 with Mathematics and Physics at A levels*	33 with Mathematics and Physics at HL level*
Bachelor of Engineering (Honours) conjoints	275 with 17 external Level 3 credits in Calculus and 16 external Level 3 credits in Physics	330 with Mathematics and Physics at A levels*	36 with Mathematics and Physics at HL level*

**The following may be accepted based on grade achieved: AS Mathematics and Physics for CIE students, and SL Physics and SL Mathematics: Analysis and Approaches for IB students.*

Calculating your rank score

National Certificate of Educational Achievement (NCEA) Level 3

Your rank score is based on your best 80 credits at Level 3 over a maximum of five approved subjects. These credits are then weighted according to the level of achievement in each set of credits: Excellence (4 points), Merit (3 points) or Achieved (2 points).

A maximum of 24 credits are counted for each approved subject. The maximum rank score is 320. If you achieve fewer than 80 credits, the rank score will be based on your total Level 3 credits gained over a maximum of five approved subjects and weighted by the level of achievement.

Credits obtained in required subjects do not have to be among the best 80 credits used to calculate the rank score. NCEA Level 3 credits achieved before Year 13 can count towards the 80 best credits used for ranking.

Those who completed Year 13 Calculus and Physics but did not meet the rank score may still be considered.

University of Cambridge International Examinations (CIE)

Your rank score is based on the UCAS Tariff score for up to six subject units at AS level (one subject unit) or A level (two subject units). A maximum of two subject units can be included from any one syllabus group in the table of available syllabus groups, which are broadly equivalent to those in the list of approved subjects for NCEA. If you have completed more than six subject units, the best six scores will be used. Thinking Skills and the General Paper will be excluded from the rank score calculation. The maximum rank score is 420. The following points are awarded for each syllabus group.

Level	A*	A	B	C	D	E
A	140 points	120 points	100 points	80 points	60 points	40 points
AS	-	60 points	50 points	40 points	30 points	20 points

International Baccalaureate (IB)

Your rank score is the same as your IB score. For example, if you achieve 27 points for IB, your rank score will be 27 points. The maximum rank score is 45.

Prior tertiary study

To transfer from another tertiary institution you must meet admission, programme, and English language requirements.

Find out more at **www.auckland.ac.nz/priortertiarystudy**

Academic English Language Requirement

The AELR aims to ensure that you have a sufficient level of competence in academic English to support your study at University. It will not affect whether you are offered a place on a programme, and may be met through your entry qualification or satisfactory completion of an approved course in your first year of study. Visit **www.auckland.ac.nz/aelr**

Alternative pathways into Engineering

If you do not have the appropriate secondary school qualification, subjects and/or rank score, there are a number of alternative pathways for gaining admission. Visit **www.engineering.auckland.ac.nz/entry-pathways**

Targeted Admission Schemes

The Faculty of Engineering is commited to equity and offers admission schemes for eligible Māori and Pacific students, students with disabilities, students from refugee backgrounds, and students from low socio-economic backgrounds. Places are limited. Applicants must have met the University Entry Standard and studied Physics and Mathematics (including Calculus).

Māori and Pacific Targeted Entry Scheme (MAPTES)

All eligible Māori and Pacific students may apply under MAPTES. Places will be allocated according to academic performance. We recommend that you apply for MAPTES even if you don't think you will have the grades to get in. Entry via MAPTES gives you access to Tuākana, our academic and mentoring support programme. See **www.engineering.auckland.ac.nz/maptes**

Apply and enrol

Closing dates for 2022	
BE(Hons) Semester One entry	8 December 2021
BE(Hons) Semester Two entry	4 July 2022

For a guide to applications, admission and enrolment, as well as to get started on the process, visit **www.apply.auckland.ac.nz**

If you applied for the next semester intake, admission decisions are made within four weeks from receipt of the required documents. Delays may occur for future semester intakes and during peak admission periods (September to January and May to July).

Once you've accepted an offer of place in a programme, you can enrol in your courses. If you need some help with the enrolment process, go to **www.auckland.ac.nz/enrolment**

You can also find out more about the courses in your engineering degree at **www.engineering.auckland.ac.nz/enrolment**

Next, you need to make sure to pay your fees! You'll find all the details at **www.auckland.ac.nz/fees**

If you feel stuck at any point in the process, you can find answers to your questions at **www.askauckland.ac.nz**

There's also someone who can help during business hours at **0800 61 62 63** or you can email **studentinfo@auckland.ac.nz**

Some late applications may be accepted after 2021 school results are received. It is advisable, however, to apply for all programmes that you might wish to study before the published closing date. Multiple applications are acceptable and all applications will be considered when 2021 results are available.

If you're not offered a place in the programme(s) of your choice, you'll receive an email with alternative options. A final offer of place generally depends on two things: your admission to the University (for school leavers, this may depend on your final results) and your assessment by the relevant faculty.

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

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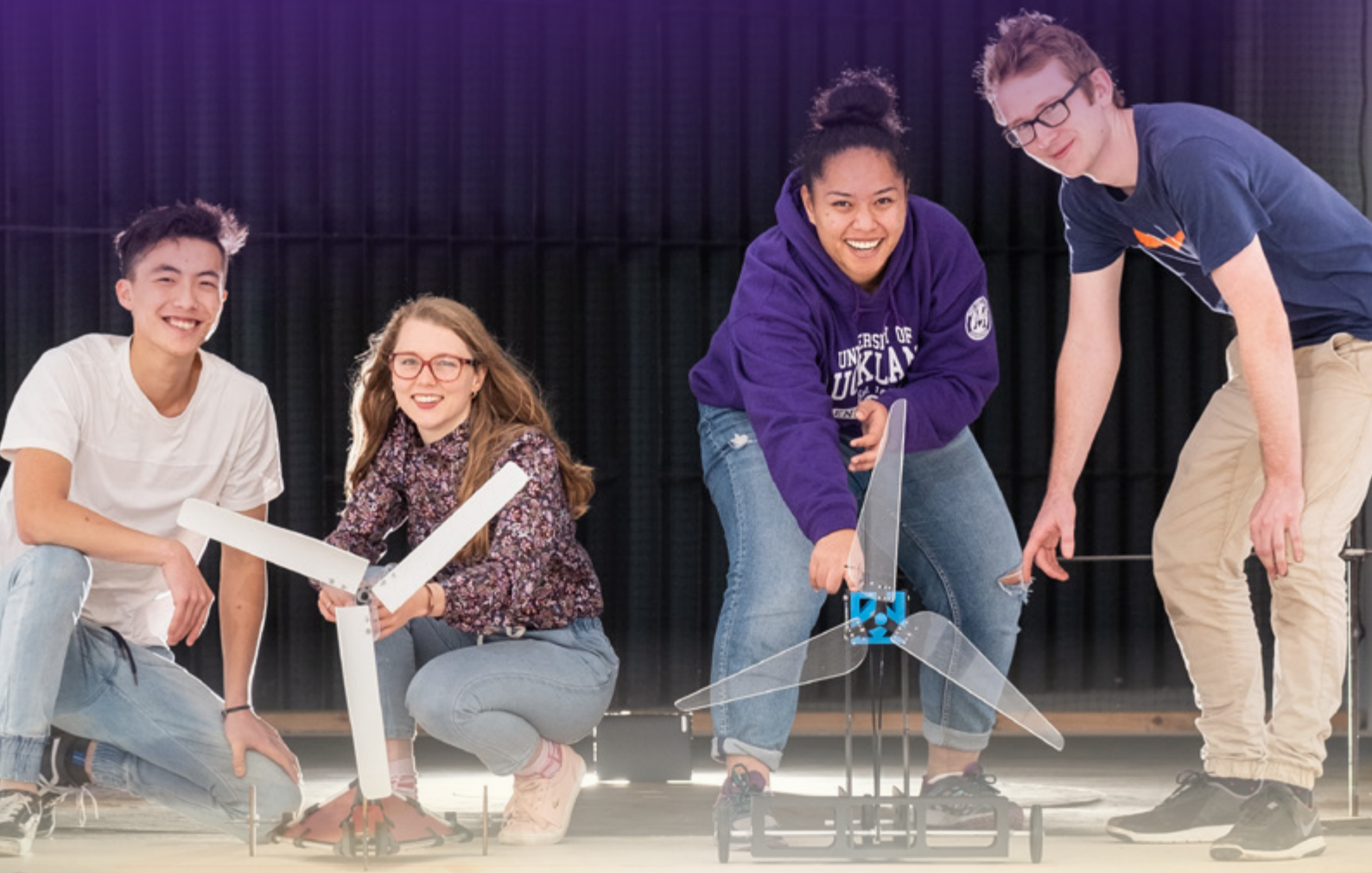

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