



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

# Science

## Undergraduate Prospectus 2021

Biological Sciences | Chemical Sciences | Computer Science | Environment  
Exercise Sciences | Marine Science | Mathematics | Physics | Psychology | Statistics



**No 1**  
New Zealand  
university\*



**No 1**  
Global  
Reputation\*\*



**No 1**  
In New Zealand  
for Employability\*\*\*



# *Nau mai, haere mai* Welcome to the Faculty of Science



Carl Sagan once said that “science is a way of thinking much more than it is a body of knowledge”. Studying Science at the University of Auckland will give you both the disciplinary knowledge and that “way of thinking”. Together these will allow you to pursue a career in your chosen discipline and provide you with the means to understand and address the challenges confronting society – and science – in the 21st century.

At the University of Auckland we cover a comprehensive range of disciplines in the courses we offer. At the Faculty of Science we’re excited to offer two undergraduate programmes, and a diverse range of subject areas.

Our three-year Bachelor of Science is a very flexible degree, which has a large variety of majors and specialisations, as well as many options for double majors and conjoint degrees.

We also offer the option to take an undergraduate programme with a research focus. The four-year Bachelor of Advanced Science (Honours) will accelerate your preparation for postgraduate study. It will also equip you with the depth of knowledge and skills demanded by today’s employers.

Whatever discipline you choose and whatever courses you take, you will discover that science itself is continually evolving. It integrates and embraces topics from cells to society, quarks to computation. Our approach is to provide you with the education to understand that evolution and allow you to enter not only today’s science-based careers, but those that will come in the future.

As a student at the University of Auckland, you will benefit from studying at New Zealand’s world-ranked university\*.

Our staff include the largest group of top-ranked, internationally renowned scientists in New Zealand, presenting you with knowledge at the cutting edge of science.

Your education will be enhanced through outstanding teaching facilities. These range from our leading-edge laboratories, including those in our new Science Centre building, to a comprehensive marine campus. You will also be able to enjoy all the recreational and cultural opportunities that Auckland, the “City of Sails”, has to offer.

Congratulations on your decision to study at the University of Auckland. I look forward to welcoming you to New Zealand’s largest Faculty of Science.

PROFESSOR JOHN HOSKING  
Dean of Science  
The University of Auckland

\*[www.science.auckland.ac.nz/excellence](http://www.science.auckland.ac.nz/excellence)



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Cover attributions:

\*Times Higher Education and QS World University Rankings 2020

\*\*QS World Rankings Academic and Employer Reputation, number one in NZ 2019

\*\*\*QS Graduate Employability Rankings 2019



A portrait of Mena Welford, a young woman with dark hair, smiling. She is wearing a colorful floral shirt and a yellow apron. The background is a blurred green outdoor setting. The image is partially covered by a blue diagonal graphic element.

## MENA WELFORD

**Bachelor of Science in Biological Sciences  
and Marine Science**

*"Originally, I came to university planning to go to med school (through a biomed degree), with ambitions of becoming a surgeon. However, the papers I genuinely enjoyed and felt were 'me' were BIOSCI 101 and 107. So, by second semester I had switched into a Biological Sciences major.*

*"I took a Marine Science paper in my third year on a whim and fell in love with its interdisciplinary aspects, compatibility with Biological Sciences and global relevance and so switched into a secondary major of Marine Science.*

*"My favourite project was part of BIOSCI 206 where we got to go to Whangarei Heads and choose some biological aspects of the environment on the rocky shores to investigate. We collected, processed, and interpreted data, then wrote up a scientific report relaying our findings. Being fully immersed in the various aspects of experimental design and data collection has only reinforced my love for biology and motivates me to see what lies beyond undergrad.*

*"The calibre of teaching I've encountered is remarkable. Irrespective of the sub-specialisation I've taken papers in, lecturers show tireless enthusiasm, passion and dedication to enabling student success.*

*"My ultimate goal is to become a scientist and an academic. Short-term, this means a Postgraduate Diploma in Science (Marine Science) and then a Master of Science. Based on how these fare, hopefully a PhD follows."*



# Why study with us?



WE'RE NEW ZEALAND'S

**leading Faculty of Science\***

**11** OF THE  
UNIVERSITY'S  
SCIENCE SUBJECTS

**Ranked 1st in  
New Zealand\***

*Biological Sciences*

*Chemistry*

*Computer Science and Information Systems*

*Earth and Marine Sciences*

*Environmental Sciences*

*Geography*

*Materials Sciences*

*Mathematics*

*Physics and Astronomy*

*Psychology*

*Statistics and Operational Research*



Our undergraduate programmes are flexible, allowing you to **follow your interests and try different courses**, while keeping your options open

**8** Science subjects rank in the **top 100 worldwide\***



We're home to the  
**Science Scholars** and  
**Tuākana in Science**  
programmes



We have new, state-of-the-art facilities, including our **award-winning undergraduate Chemistry laboratory**

[www.science.auckland.ac.nz/sciencescholars](http://www.science.auckland.ac.nz/sciencescholars)

[www.science.auckland.ac.nz/tuakana](http://www.science.auckland.ac.nz/tuakana)

\*QS World University Rankings by Subject 2019

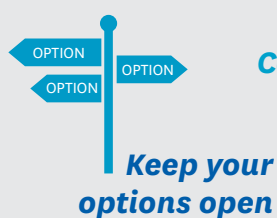
# What can you study?

Students start their study in Science with either the Bachelor of Science (BSc) or the Bachelor of Advanced Science (Honours) (BAdvSci(Hons)). Within both programmes our subjects can be divided into five areas: Biological, Health and Life Sciences; Chemical and Physical Sciences; Earth and Environmental Sciences; Human, Social and Behavioural Sciences; and Mathematical and Computational Sciences.

As well as acquiring the academic skills and techniques that are part of your chosen subject, you will also encounter new technologies and cutting-edge research methods.

## Bachelor of Science

It takes **3** years to complete a BSc



Can take **2** majors

Do a student-led capstone course

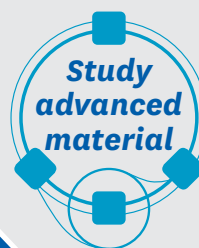
Study a conjoint programme

Transfer between programmes\*

\*Subject to faculty approval

## Bachelor of Advanced Science (Honours)

It takes **4** years to complete a BAdvSci(Hons)



Do research with an academic mentor

Can progress straight to a PhD

## Glossary

Here are the definitions of some terms you will see and hear as you begin your journey to University:

**Capstone course:** a student-led project providing you with an opportunity to integrate your previous learning and apply it to a real-world problem in your subject area

**Conjoint:** a programme in which you study towards two undergraduate bachelors degrees at the same time

**Core course:** a course that is integral to your programme, and is therefore compulsory

**Major:** a subject area that makes up about a third of the courses in your BSc (All majors can be taken as part of a double major, and most are available as part of a conjoint degree.)

**Module:** a group of three, related skills-based courses you can choose to include in your programme

**Pathway:** a group of courses within a major or specialisation that are focused on a particular area of study

**Specialisation:** a subject area that makes up more than half of the courses in your degree



## Science subjects quick reference table

| Science subject                                | Available as a major in the BSc | Available as a specialisation in the BSc | Available as a specialisation in the BAdvSci(Hons) | Available in a conjoint |
|--|---------------------------------|--|--|-------------------------|
| <b>Biological, health and life sciences</b>    |                                 |  |  |                         |
| Biological Sciences                            | ✓                               |  |  | ✓                       |
| Biomedical Science                             |                                 | ✓  |  |                         |
| Ecology  |                                 |  | ✓  | ✓                       |
| Exercise Sciences                              | ✓                               |  |  | ✓                       |
| Marine Science                                 | ✓                               |  | ✓  | ✓                       |
| Pharmacology                                   | ✓                               |  |  | ✓                       |
| Physiology                                     | ✓                               |  |  | ✓                       |
| <b>Chemical and physical sciences</b>          |                                 |  |  |                         |
| Chemistry                                      | ✓                               |  | ✓  | ✓                       |
| Food Science and Nutrition                     |                                 | ✓  |  |                         |
| Geophysics                                     | ✓                               |  |  | ✓                       |
| Green Chemical Science                         |                                 | ✓  | ✓  |                         |
| Medicinal Chemistry                            |                                 | ✓  |  |                         |
| Physics  | ✓                               |  | ✓  | ✓                       |
| <b>Earth and environmental sciences</b>        |                                 |  |  |                         |
| Earth Sciences                                 | ✓                               |  |  | ✓                       |
| Environmental Change                           |                                 |  | ✓  | ✓                       |
| Environmental Science                          | ✓                               |  |  | ✓                       |
| Geographic Information Science                 | ✓                               |  |  | ✓                       |
| Geography                                      | ✓                               |  |  | ✓                       |
| Geology  |                                 |  | ✓  | ✓                       |
| <b>Human, social and behavioural sciences</b>  |                                 |  |  |                         |
| Anthropological Science                        | ✓                               |  |  |                         |
| Psychology                                     | ✓                               |  | ✓  | ✓                       |
| <b>Mathematical and computational sciences</b> |                                 |  |  |                         |
| Computer Science                               | ✓                               |  | ✓  | ✓                       |
| Computational Biology                          |                                 |  | ✓  | ✓                       |
| Data Science                                   |                                 | ✓  |  |                         |
| Information and Technology Management          | ✓                               |  |  |                         |
| Logic and Computation                          | ✓                               |  |  |                         |
| Mathematics                                    | ✓                               |  | ✓  | ✓                       |
| Statistics                                     | ✓                               |  | ✓  | ✓                       |



## MATT ILLING

*Bachelor of Advanced Science (Honours)  
in Environmental Change*

*"I have always been passionate about the environment and particularly in the science of our changing climate. When I was deciding what to study, I found that it was impossible for me to pick only one or two majors. Studying Environmental Change means that I can take my pick of courses from Geography, Earth Sciences, Environmental Science, Marine Science and more! This freedom to pick and choose from multiple majors really drew me to this programme.*

*"As a member of Science Scholars, I had to write a popular science article on a topic of my choosing. I chose paleoclimatology (past climate change), a subject I am really interested in. I had to try and take a complicated topic and explain it in a way that someone with no understanding of the complexities of climate change would be able to understand. This was challenging but I really enjoyed practising science communication about a topic I am passionate about.*

*"The University of Auckland was the only university which offered the unique Bachelor of Advanced Science (Honours) and all its perks. It is also the best university in New Zealand for Geography and the Environmental Sciences. I saw the breadth of School of Environment courses here at Auckland and the facilities available, and it would have been a mistake to go anywhere else.*

*"At the moment I would like to continue my education through to postgraduate level. The Bachelor of Advanced Science (Honours) programme can lead straight onto PhD study which is really appealing to me. I am really interested in studying climate change and its effects, past, present and future. I hope that one day I will be able to undertake research that will help humanity fight climate change."*





# Bachelor of Science (BSc)

The Bachelor of Science (BSc) programme allows you to incorporate different areas of interest and expertise, and its flexible structure means you don't have to make absolute decisions early on.

## Quick facts

**Full-time:** 3 years

(part-time study options available)

**Points per degree:** 360

(24 x 15-point courses)

**Taught at:** City, Grafton and Newmarket Campuses

**Subject areas:** Choose from the large variety on pages 12–24

**Application closing dates:**

8 December 2020 (Late applications will be considered if places are available.)

**Classes start:**

Summer School: 6 January 2021

Semester One: 1 March 2021

Semester Two: 19 July 2021

[www.science.auckland.ac.nz/bsc](http://www.science.auckland.ac.nz/bsc)



## What you'll be studying

### In your first year:

- You should enrol in eight courses in up to three subject areas to discover your strengths and interests
- You will probably take four courses in Semester One and four courses in Semester Two

### In your second year and beyond:

- You will enrol in a range of more advanced courses relating to your main subject, as well as other areas within the Science schedules to add breadth to your knowledge
- You must complete two courses from the General Education schedules

### In your final year:

- You will complete a capstone course for your chosen major or specialisation

## BSc subjects

### Biological, health and life sciences

- Biological Sciences
- Biomedical Science
- Exercise Sciences
- Food Science and Nutrition
- Marine Science
- Pharmacology
- Physiology

### Chemical and physical sciences

- Chemistry
- Food Science and Nutrition
- Geophysics
- Green Chemical Science
- Medicinal Chemistry
- Physics

### Earth and environmental sciences

- Earth Sciences
- Environmental Science
- Geographic Information Science
- Geography
- Geophysics
- Marine Science

### Human, social and behavioural sciences

- Anthropological Science
- Exercise Sciences
- Geography
- Psychology

### Mathematical and computational sciences

- Computer Science
- Data Science
- Geographic Information Science
- Information and Technology Management
- Logic and Computation
- Mathematics
- Statistics

Find out more about our majors, specialisations and pathways on pages 12–24.

# Bachelor of Advanced Science (Honours) (BAdvSci(Hons))

If you have a clear idea about the direction you want to take in science, and you're ready to undertake a four-year programme, then the Bachelor of Advanced Science (Honours) could be for you.



## Quick facts

**Full-time:** 4 years  
(part-time study options available)

**Points per degree:** 480  
(32 x 15-point courses)

**Taught at:** City, Grafton and Newmarket  
Campuses

**Subject areas:** Choose from the wide  
variety on pages 12–24

**Application closing dates:**  
8 December 2020 (Late applications will be  
considered if places are available.)

**Classes start:**  
Summer School: 6 January 2021  
Semester One: 1 March 2021  
Semester Two: 19 July 2021

[www.science.auckland.ac.nz/  
badvsci-hons](http://www.science.auckland.ac.nz/badvsci-hons)

and research skills relevant to your chosen specialisation. Depending on your grades, you may qualify to enter directly into a PhD programme. Alternatively, you will be well placed to seek employment in your sector of interest.

## What you'll be studying

### In your first year:

- You will probably take four courses in Semester One and four courses in Semester Two
- You should include courses relating to your chosen specialisation, as well as a core course and other courses in the Science schedules

### In your second year and beyond:

- You will enrol in a range of more advanced courses relating to your chosen specialisation, as well as additional core courses and other courses within the Science schedules to add depth to your knowledge
- You must complete two courses from the General Education schedules

### In your final year:

- You will enrol in a range of postgraduate courses related to your specialisation

- You will complete your own research project related to your specialisation, in collaboration with one of our researchers
- Depending on how well you do across your courses, you may be eligible for direct entry into a PhD

## BAdvSci(Hons) subjects

- Chemistry
- Computational Biology
- Computer Science
- Ecology
- Environmental Change
- Geology
- Green Chemical Science
- Marine Science
- Mathematics
- Physics
- Psychology
- Statistics

Find out more about our specialisations  
on pages 12–24.

## BAdvSci(Hons)

We designed this programme with budding scientists in mind – the BAdvSci(Hons) is for students who want to pursue postgraduate research. You'll emerge from your four-year degree with advanced disciplinary knowledge



# Conjoint programmes

Conjoints allow very able students to complete another undergraduate programme alongside their BSc or BAdvSci(Hons) in a reduced time frame. If you have broad interests and you don't want to limit your studies to one degree, a conjoint could be for you.

Conjoints strengthen your employability. A Science conjoint gives you an advantage in the professional world because you'll be able to work with scientists and apply the principles of science to your role. Conjoint students must complete both programmes before they're able to graduate.

Both the Bachelor of Science and the Bachelor of Advanced Science (Honours) are available in conjoint programmes.

You can combine either of them with programmes offered by other faculties:

- Arts: BA/BSc or BAdvSci(Hons)/BA
- Commerce: BCom/BSc or BAdvSci(Hons)/BCom
- Design: BDes/BSc or BAdvSci(Hons)/BDes
- Engineering: BE(Hons)/BSc or BAdvSci(Hons)/BE(Hons)
- Global Studies: BGlobalSt/BSc or BAdvSci(Hons)/BGlobalSt
- Health Sciences: BHSc/BSc or BAdvSci(Hons)/BHSc

- Law: LLB/BSc, LLB(Hons)/BSc, BAdvSci(Hons)/LLB or BAdvSci(Hons)/LLB(Hons)
- Music: BMus/BSc or BAdvSci(Hons)/BMus
- Nursing: BNurs/BSc or BAdvSci(Hons)/BNurs
- Property: BProp/BSc or BAdvSci(Hons)/BProp

With the exception of Engineering, Law and BAdvSci(Hons) conjoints, these programmes can be completed in four years, although many students take an extra semester to complete the requirements.

Not all Science subject areas are available in a conjoint programme – read more on pages 12–24.

It is important to take note of any special conditions that may apply. Check *The University of Auckland Calendar* or make an appointment with an academic adviser in the Science Student Centre.

[www.science.auckland.ac.nz/conjoint](http://www.science.auckland.ac.nz/conjoint)



## MAX KIM

**Bachelor of Science and Bachelor of Commerce conjoint in Psychology, Statistics, Marketing and Information Systems**

*"I've always been interested in human behaviour. Studying Psychology and Statistics lets me build my knowledge, as well as analytical and writing skills. I also chose to major in Marketing and Information Systems in my Commerce degree to help improve my problem-solving skills with real-world cases."*

*"My conjoint degree gives me the chance to learn and interact with people from different faculties, and it broadens my job opportunities – I could become a business consultant, psychologist or a data analyst. Also, the skills I learn in my Science and Commerce degrees complement each other, so I'm able to improve my abilities and achieve higher standards."*

*"I chose to study at the University of Auckland because it is the top university in New Zealand and with high international recognition, it attracts talented people from different regions. Surrounding myself with smart and ambitious people helps me constantly challenge myself to achieve."*

*"Environment and friendships are important aspects in University life. Both the Faculty of Science and the Business School have amazing people and environments that foster interaction. Meeting different people and making a lot of friendships helps with networking for my future career, and makes University life so much more enjoyable."*

# Science subjects

For all information and conditions, please refer to *The University of Auckland Calendar*.



## Biological, health and life sciences

### Biological Sciences

Biology lies at the core of New Zealand's economic and natural environments. The biological sciences have never been more important for preserving our economic prosperity and the natural biodiversity of our islands in the face of global threats like climate change and population growth.

Discovery in the biosciences has advanced at breathtaking speed. This has led to a new generation of therapies in health and medicine; sustainable consumer-focused products in ag biotech industries; and novel strategies for the protection of fragile ecosystems.

The Biological Sciences major captures the transformational potential of modern bioscience across all areas. You'll gain an integrated knowledge base across the discipline with training in the relevant skillsets for employment. The programme also offers the opportunity for specialist study choices in niche areas.

As a Biological Sciences student, you'll take common core courses in each year of study. Beyond these compulsory courses you can choose to keep it general, or else follow one or more pathways in specialist fields of biology that deliver a series of focused and complementary courses:

- **Biochemistry and Cell Biology:** The structure and function of molecules and how they interact inside cells
- **Biotechnology:** The commercial development of new knowledge and discovery in the biosciences
- **Ecology:** Interactions between organisms and their environment
- **Evolution:** Changes in heritable characteristics of organisms over successive generations
- **Genetics:** The molecular basis of heredity and the role of genes in disease
- **Marine Biology:** The study of organisms that live in our oceans

- **Microbiology:** The study of viruses, bacteria, fungi and other microscopic organisms
- **Plant Biology:** Plants viewed from a molecular, cellular, physiological and biotechnological perspective
- **Zoology:** The anatomy, physiology, evolution and behaviour of animals

As part of your major you'll complete the Biological Sciences capstone course, BIOSCI 399 Biological Science in a Post-truth World, which will allow you to debate contemporary issues in biology, and explore how these issues are interpreted from a cultural, political and economic perspective.

Complementary majors include Anthropological Science, Chemistry, Computer Science, Earth Sciences, Environmental Science, Exercise Sciences, Geography, Psychology and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint



## Biomedical Science

If you're a very able student with a passion for understanding the scientific basis of health and disease in humans and animals, then Biomedical Science could be the specialisation for you.

This challenging and immensely rewarding specialisation will deliver rigorous scientific training in a range of disciplines, allowing you to gain unique insights into important and rapidly developing areas of modern research.

The specialisation is highly prescriptive, and is one of only two ways in which you can be selected for Medicine (MBChB) at the end of your first year at Auckland. The first year of the Biomedical Science specialisation includes compulsory courses that all students must take.

However, as you progress through your second and third years, you can choose to keep it general or opt for one of the following pathways to focus your studies:

- **Anatomical Imaging Science:** Learn how detailed anatomy can be made accessible for teaching, medical imaging, surgical planning and biomedical applications. You'll study the foundations of anatomical dissection, various approaches to medical imaging and image analysis.
- **Cancer Biology and Therapeutics:** Gain an in-depth understanding of the molecular and genetic basis of cancers, study therapeutic strategies for treating disease and learn about the pharmacological principles of drug discovery.
- **Cardiovascular Biology:** Gain an in-depth understanding of the structure, function and regulation of the cardiovascular system in order to investigate the origins of various cardiovascular diseases that are prevalent in our community.
- **Cellular and Molecular Biomedicine:** Explore the foundations for our current understanding of many diseases, which allows the design and development of effective diagnosis and treatment.
- **Genetics:** Genetics holds tremendous promise for understanding, diagnosing and treating disease. This pathway will give you the foundations for understanding how our genes impact health and wellbeing.
- **Infection and Immunity:** Explore the complex interplay between microbes and their hosts and learn the essential principles of infectious diseases, vaccination and immunological disorders.
- **Neuroscience:** Understanding the brain and related structures in health and disease is the final frontier. You'll study the developmental origins of the nervous system, its structure and function, what goes wrong in neurological disease, and cutting-edge approaches to improve outcomes from the treatment of brain disease.



- **Nutrition and Metabolism:** Nutrition is a key determinant of health. This pathway will give you the foundations for understanding the role of nutrients in metabolic regulation and the influence of the genome on nutrition.
- **Reproduction and Development:** Reproduction is key to life. In this pathway you'll discover that humans are not as good at reproduction as you may think, and you'll study the amazing technologies that have been developed to enhance reproductive success.

As part of your specialisation you will complete the Biomedical Science capstone course. This will allow you to debate contemporary issues and use your scientific reasoning to challenge misunderstandings and misrepresentation in biomedical research – all while you hone your skills as a scientific communicator.

✓ BSc specialisation

## Computational Biology

Computational Biology equips biologists and life scientists for research that now routinely requires computation and complex data analysis.

As a Computational Biology student you'll be able to choose from a range of complementary courses in Biological and Biomedical Sciences, Chemistry, Computer Science, Mathematics and Statistics, and, in your fourth year, you'll complete independent research under the guidance of an academic mentor. This research will give you the opportunity to integrate and apply your knowledge and skills while thinking critically about what you've learnt.

This specialisation enables students to gain fundamental knowledge across Biology, Computer Science and Statistics to develop Computational Biology, Genomics and

Bioinformatics skill sets – all skills that are required by employers in academia and industry, where analysis of life science data is increasingly important.

- ✓ BAdvSci(Hons)
- ✓ Available in a conjoint

## Ecology

Ecology is the study of processes influencing the distribution and interactions of organisms and their relationship with the physical environment. It brings together multiple disciplines to focus on core biological and physical concepts in ecological theory and the application of that knowledge to environmental issues. It incorporates training in the computational, modelling and statistical techniques that are increasingly being used in the analysis and application of scientific data to solve ecological problems.

As a BAdvSci(Hons) Ecology student you'll take courses in Biological Sciences, Environmental Science, Marine Science and Statistics. In your fourth year, you'll also have the chance to further develop your quantitative and advanced research skills when you complete an independent research project under the guidance of an academic mentor.

Careers that demand training in Ecology are increasingly focused on applied environmental issues and require graduates who have been highly trained in merging biological, physical and management perspectives and who have strong quantitative abilities. Your BAdvSci(Hons) in Ecology will arm you with the skills you need to progress to doctoral study, or enter the workforce.

- ✓ BAdvSci(Hons)
- ✓ Available in a conjoint



## Exercise Sciences

In Exercise Sciences you'll study the physiological, psychological, biomechanical and neural influences on human performance in exercise, sport and the workplace. The programme focuses on both health and disease. This practical and diverse major will offer you the skills you need to work with people in movement science, health, wellness, rehabilitation and sport science.

Laboratory work plays an important role in the Exercise Sciences major and is based around the analysis and evaluation of data collected from people engaged in physical activity. The Department of Exercise Sciences has research facilities to support studies. These include the Exercise Physiology, Biomechanics and Movement Neuroscience Laboratories, and the Health and Rehabilitation Clinic. As part of your major you will complete the Exercise Sciences capstone course, EXERSCI 399 Applying Exercise Science, where you will use your theoretical knowledge and practical skills in a supervised research project.

Complementary majors include Biological Sciences, Chemistry, Computer Science, Physics, Physiology, Psychology and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint

## Food Science and Nutrition

See *Chemical and physical sciences*, page 16.

## Marine Science

See *Earth and environmental sciences*, page 19.

## Pharmacology

Pharmacology is the study of chemicals that are biologically active and can be used to modify, cure or prevent illness. In practice, this requires a detailed understanding of both how the body functions and the problems that can occur. By identifying cellular and chemical abnormalities of the disease state, it's possible to design molecules to fix problems that arise.

As a Pharmacology student you'll study how drugs work at the molecular level and in living organisms, and factors that influence safe and effective drug use in various populations. You'll take courses that focus on the interaction of drugs with target molecules, the biochemical processes involved in achieving clinically relevant drug concentrations, and the way in which diseases can be treated in a variety of organ systems.

As part of your Pharmacology major you'll complete a capstone course, PHARMCOL 399, where you work both individually and in small groups to apply the knowledge you've gained and demonstrate mastery of fundamental methods in Pharmacology. You'll investigate the processes of drug development within the ethical and legal framework for using experimental animals and human subjects in New Zealand.

Complementary majors include Biological Sciences, Chemistry, Physics, Physiology, Psychology and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint

## Physiology

Physiology is the study of how living organisms function, from the cellular to the whole-body level. Understanding how organisms work helps us to understand what goes wrong in disease, and provides a scientific basis for its treatment. Physiology is highly quantitative and has close links with biochemistry, molecular biology, mathematical modelling and pharmacology, as well as zoology and neuroscience.

Physiology is a strong, research-focused department that offers world-class, research-inspired teaching. We connect fundamental biology with biomedical and bioengineering fields in many topics, including endocrinology and cardiovascular, respiratory, renal, vision and hearing, neuroscience, fetal and neonatal, cellular and molecular science.

As a Physiology student, you'll take courses in Biological Sciences, Chemistry, Medical Science, Physics and Statistics to give you a solid quantitative grounding and to encourage critical thinking, science innovation and translation. As part of your Physiology major you'll complete a capstone course, PHYSIOL 399, where you'll demonstrate your knowledge and skills through the design of a scientific research project. You'll explore the role of science and scientists in society, ethics, science communication, and commitment to Māori and Pacific health advancement.

You'll graduate with expertise and knowledge that will allow you to take up diverse opportunities in research, clinical medicine or industry.

Complementary majors include Biological Sciences, Chemistry, Exercise Sciences, Mathematics, Pharmacology, Physics, Psychology and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint





## **ADITI SHEREKAR**

**Bachelor of Science in Computer  
Science and Psychology**

*"After studying elsewhere in my first year, I decided to move to the University of Auckland. I became really interested in neurology, which led me to taking Psychology as a major. In my second year of my BSc I decided to add Computer Science as another major because I wanted to take my degree a step further to open up more opportunities when I complete my studies.*

*"The motivation for adding a Computer Science major came from one of my first-year General Education Computer Science courses – I found the coding aspect intriguing. I believe the combination of these majors is unique, and beneficial to my future career prospects.*

*"Both healthcare and technology are growing industries in today's world. After completing my degree I'd like to use technology to make a difference in healthcare. At this point in time it needs extra attention and therefore I would love the opportunity to help make people's lives better and easier.*

*"I thoroughly appreciate the amount of help that's provided. The guidance and support I receive have encouraged me to strive for high achievement throughout my degree. I received a Certificate of Achievement for getting high grades in Computer Science, which I'm really proud of.*

*"The University of Auckland has a very diverse culture, which allows for immense growth. Throughout my time at University I've come across many different personalities who have been highly inspiring. Along with making lifelong friendships, the guidance, support and countless opportunities, both educational and social, that the University provides have allowed me to learn and grow. This has made my University experience the most memorable time of my life. I'll cherish it forever."*





# Chemical and physical sciences

## Chemistry

Chemistry is the science of atoms and molecules. It deals with molecular structure and synthesis, chemical reactions and theoretical models that explain molecular behaviour. Chemistry is a central science – it aims to understand the structure and properties of the world around us, and underpins fields as diverse as biology, geology, environmental science, medicine and engineering. The practice of Chemistry leads to new substances and better processing reactions. It also enhances our understanding of materials, biological processing and the environment. All core courses have a hands-on laboratory component, and your Chemistry studies will develop your ability to think logically, analyse complex systems, communicate clearly, and be creative, numerate and computer literate.

If you study Chemistry as a BSc major, you'll complete CHEM 399, the Chemistry capstone course, which will allow you to undertake an original laboratory research project or experiment, communicating your findings in both written and oral form.

Complementary BSc majors include Anthropological Science, Biological Sciences, Earth Sciences, Environmental Science, Geography, Mathematics and Statistics.

The BAdvSci(Hons) specialisation focuses on chemistry as a multi-disciplinary science. It includes an introduction to recent research, interdisciplinary aspects of chemical science research and the pathways to commercial applications of chemistry through research.

The BAdvSci(Hons) in Chemistry will teach you about the interplay of chemistry with other scientific disciplines and also with the commercial world, both of which are increasingly relevant in today's society.

For BAdvSci(Hons) students there are compulsory core courses, which you'll have to take, but you can explore additional areas of your choice once you're in your third year. You'll also complete two advanced courses, which will prepare you to engage in research in the final year of your degree. This experience with research and research methods will also provide you with a strong foundation for postgraduate study in Chemistry.

- ✓ BSc major or BAdvSci(Hons)
- ✓ Available in a conjoint

## Food Science and Nutrition

This challenging and prescriptive specialisation offers two distinct pathways.

If you pursue the **Food Science pathway** you'll study all aspects of manufacturing, processing and production in food-related industries, including nutrigenomics, emerging technologies, food safety and product development.

If you pursue the **Nutrition pathway** you'll study human nutrition, the maintenance of good health and the wellbeing of populations. These topics require you to consider the environmental, social, economic and cultural aspects of eating behaviour and how they impact health.

As part of your Food Science and Nutrition specialisation you'll complete FOODSCI 399, the Food Science and Nutrition capstone course, where you will work with other students to identify and develop a new food product or system in response to a nutritional issue.

- ✓ BSc specialisation

## Geophysics

Geophysics is the study of the Earth and environment, using physics and mathematics. It spans from the deep interior of the Earth to its surface, oceans and atmosphere. Geophysicists aim to explain the physical phenomena we observe today to discover their past history and model their future behaviour.

As a Geophysics student you'll learn how to apply your knowledge of mathematics and physics to the study of global processes. You'll explore plate tectonics, natural hazards, natural resources, the oceans, atmosphere and climate. As part of your major you'll complete the Geophysics capstone course, GEOPHYS 399, where you'll investigate and report on key geophysical phenomena, using experimental, observational, computational and numerical processes.

Complementary majors include Computer Science, Earth Sciences, Environmental Science, Geography, Mathematics, Physics and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint



## Green Chemical Science

Green Chemical Science involves the use of chemical principles, science and technology to advance society in ways that are sustainable and safe for the environment – and to tackle global issues that impact on sustainability. The approaches include interdisciplinary studies in catalysis, synthesis, toxicology, analytical methodology, materials science, and biochemistry.

As a Green Chemical Science student you'll have an interdisciplinary and highly practical learning experience. You'll study topics such as pollution elimination, clean water production, production of materials from renewable feedstocks, mitigation of global warming, and the development of renewable energy technologies.

If you choose to study Green Chemical Science as a BSc specialisation, you'll complete CHEM 397, the Green Chemical Science capstone course, where you'll undertake original research in Green Chemical Science, communicating your findings in academic and industry scenarios.

If you study Green Chemical Science as a BAdvSci(Hons) specialisation, you will acquire advanced disciplinary knowledge and research skills that will prepare you to engage in research in the final year of your four-year degree.

There's an increasing number of jobs available in the sustainability science arena. Studying Green Chemical Science will equip you with the necessary skills and knowledge to take advantage of these career opportunities, and to contribute to society in a meaningful and informed way.

✓ BSc specialisation or BAdvSci(Hons)

## Medicinal Chemistry

Medicinal Chemistry is the study of the design, biochemical effects, regulatory and ethical aspects of drugs for the treatment of disease. It's one of the most rapidly developing areas within the discipline of chemistry, both globally and locally.

As a Medicinal Chemistry student you'll gain a strong foundation in biological and chemical techniques that are relevant to the pharmaceutical world. You'll also have the chance to learn about the synthesis, reactivity and analysis of organic compounds, and you'll gain valuable insight into the pharmacological, regulatory and ethical aspects of these bioactive compounds.

As part of your Medicinal Chemistry specialisation you'll complete CHEM 398, the Medicinal Chemistry capstone course, where you'll work independently and in small groups to investigate both currently used and potential new therapeutic agents.

✓ BSc specialisation

## Physics

Physics is arguably the most fundamental of all sciences. If you understand the principles of physics and the laws of nature, you'll have a sharp insight into the world around you. All of modern science and technology is underpinned by Physics. A degree in Physics will give you an understanding of the nature of matter as well as training in experimental methods and the mathematical analysis of physical processes.

As a Physics student you'll find out how to undertake rigorous investigations into matter, the concepts of energy and force, and the laws of nature. You'll have the chance to apply your learning to areas such as acoustics, astronomy, electronics (including medical imaging and devices, fibre optics and telecommunications), lasers, meteorology, nuclear physics and quantum physics. Physics is available in the BSc and the BAdvSci(Hons).

If you study Physics as a BSc major you can choose to keep it general, or follow one of two Physics pathways, in order to focus your studies further:

- **Medical Physics and Imaging Technology:** The science of biomedical optics, biophotonics and medical physics. Students on this pathway will gain specialist training in the use of optical and laser technologies for biomedical studies, with applications in sensing, medicine and modelling.
- **Photonics:** The science and technology of light. Students on this pathway will gain specialist training in photonic and electronic engineering, advanced physics and mathematical electronics.

As part of your BSc major you'll complete a Physics capstone course, where you'll employ core methodologies (experimental, observational, computational and numerical) to investigate some aspect of a key physical phenomenon. You'll relate your findings to contemporary research in the field, and also consider wider societal aspects and issues.

The Physics major allows you to develop your skills in experimental methods and mathematical analysis, while emphasising the importance of understanding your knowledge in a broader scientific context and being able to apply it to real-life situations and problems.

Complementary BSc majors include Chemistry, Computer Science, Earth Sciences, Environmental Science, Geophysics, Mathematics and Statistics.

If you study Physics as a BAdvSci(Hons) specialisation, you'll take core courses in Physics, Mathematics and Computer Science to sharpen your disciplinary focus. You'll learn how to undertake rigorous investigations into matter, the concepts of energy and force, and the laws of nature. Areas of study include acoustics, astronomy, electronics, medical imaging and devices, fibre optics and telecommunications, lasers, meteorology, nuclear physics and quantum physics. In your fourth year, you'll complete an independent research project and dissertation.

✓ BSc major or BAdvSci(Hons)

✓ Available in a conjoint





# Earth and environmental sciences



## Earth Sciences

The Earth Sciences major explores the processes that have shaped Earth, from its deepest interior to its surface, and into neighbouring space. It investigates the complexity and interactions of Earth's systems. It addresses the impact of natural processes on society, and vice versa.

As an Earth Sciences student you can keep it general or else choose one of the following pathways to focus your studies:

- **Climate:** Explore the interactions of the atmosphere, ocean and land that create our climate and investigate the evolution of climate over time.
- **Earth Surface Processes:** Examine how coasts, rivers and hillslopes are shaped by surface processes and influenced by the underlying geology.
- **Geology:** Explore the solid Earth and the processes that have shaped its evolution, spanning the early solar system and origins of life, plate tectonics, volcanoes, earthquakes and natural resources.

As part of your Earth Sciences major you'll complete the Earth Sciences capstone course, EARTHSCI 399, where you will carry out research or practice in Earth Sciences using the skills and knowledge you've gained throughout your studies.

Complementary majors include Anthropological Science, Biological Sciences, Chemistry, Environmental Science, Physics and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint



## Ecology

See *Biological, health and life sciences*, page 13.

## Environmental Change

Our environment is in constant flux. Environmental change has both natural and human causes. As the Anthropocene progresses, human influence on the environment will increase, but it will be layered over natural environmental variability.

The BAdvSci(Hons) in Environmental Change is ideal for students who are interested in gaining a deep understanding of the science of contemporary environmental change research – research that is multi-disciplinary, collaborative and holistic.

As an Environmental Change student you'll have flexibility in your choice of courses, but climate change will be a central theme. You'll have opportunities to learn how the past is dated and reconstructed, how to project future environmental change, and the implications of change on societies.

In your fourth year, you'll apply your advanced knowledge and skills as you undertake independent research and a dissertation. This could be the gateway to doctoral research, or to employment as a skilled practitioner whose holistic perspective has prepared them to tackle the challenges of a rapidly changing modern world.

- ✓ BAdvSci(Hons)
- ✓ Available in a conjoint



## Environmental Science

Environmental Science aims to understand the environment, using input from a wide variety of science disciplines. These include biology, chemistry, geography, earth sciences, physics and engineering, in conjunction with social sciences like economics and human geography.

Environmental Science focuses on the environmental effects of human activity and is dedicated to protecting and restoring natural heritage, minimising human impact and reversing environmental degradation.

In your Environmental Science major you will study a range of topics, including conservation project management; policy and planning for sustainable development; computer modelling of environmental problems; and human interactions with environmental systems and processes. As part of your major you will complete the Environmental Science capstone course, ENVSCI 399, where you will undertake an independent research project.

Complementary subjects include Biological Sciences, Chemistry, Earth Sciences, Geography, Mathematics, Physics and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint

## Geographic Information Science

If you've ever dropped a pin into Google maps, or found the shortest route using the public transport network, then you've engaged with Geographic Information Science (GIScience). This major is the study of the data structures and techniques used to capture, process and visualise geographic information.

It is estimated that 80 percent of data collected has some spatial component, whether it's a city name, a street address or even a precise set of co-ordinates. We'll teach you how to use data collected by satellites and drones, government-sourced data, and social media platforms to examine a wide range of social and natural processes.

As a Geographic Information Science student, you'll use a range of methods to answer questions like, "What is the relationship between urban inequality and disease?" and "What are the effects of sea level rise on coastal areas?" You'll also have the chance to use modelling techniques to analyse data intensive contexts, such as the flow of resources across a public transportation system.

As part of your major you'll complete the GIScience capstone course, GISCI 399, where you'll design and carry out an independent research project under the guidance of an academic mentor.

Complementary majors include Computer Science, Data Science, Earth Science, Environmental Science, Geography, Marine Science and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint

## Geography

Geographers ask questions about society and the environment. They study the natural processes of the physical environment, as well as human activities and their consequences. Some geographers specialise in coastal, glacial or fluvial processes and landforms, climatology, biogeography, hydrology or environmental change. Others study regional economics, population change, the problems of rural or urban areas, or the experience of particular groups in society.

As a Geography student you'll study weather, wave, tide and river monitoring and analysis; demographic and economic analysis; the interpretation of physical and cultural landscapes; mapping, cartography and geo-visualisation; analysis of soils and sediments; and many more topics. Fieldwork is an important part of studying Geography.

As part of your major you will complete the Geography capstone course, GEOG 399, where you'll undertake an independent, field-based research project and communicate your findings.

Complementary majors include Biological Sciences, Chemistry, Computer Science, Earth Sciences, Environmental Science, Psychology and Statistics.

- ✓ BSc major
- ✓ Available in a conjoint

## Geology

If you're interested in a career – or higher-level research – in the geological sciences, then a BAdvSci(Hons) in Geology will appeal to you. This specialisation will provide you with a strong foundation in geomorphology, Earth materials, Earth history and Earth structure. Your advanced courses will give greater breadth and depth to your disciplinary knowledge.

We've created a compulsory field and laboratory geology skills course, which will provide you with an opportunity for advanced practice and research preparation under the guidance of an academic mentor.

In your fourth year, as well as benefitting from plenty of opportunities to apply your skills and knowledge, you'll tackle an independent research project and dissertation. This will equip you to enter doctoral studies if you attain the required grades, or find employment in

sectors such as natural resources, hazards, environmental science and teaching.

- ✓ BAdvSci(Hons)
- ✓ Available in a conjoint

## Geophysics

See Chemical and physical sciences, page 17.

## Marine Science

New Zealand is surrounded by ocean; in fact, New Zealand occupies a strategic position in the Southwest Pacific Ocean. The challenge we face as a country is to continue to provide for the development and sustainable management of this vast marine realm. Understanding and managing the oceans requires a multi-disciplinary approach. Scientists need core skills in one or more individual disciplines and the ability to take a collaborative approach to research. Marine Science is available in the BSc and the BAdvSci(Hons).

If you study Marine Science as a BSc major, you'll take a variety of courses from Biological Sciences, Earth Sciences, Environmental Science, Geography and Statistics. In your final year you'll complete a compulsory capstone course, MARINE 399, where you'll demonstrate your learning by working on a student-led project.

Complementary BSc majors include Biological Sciences, Chemistry, Earth Sciences, Environmental Science, Geography, Mathematics and Statistics.

If you study Marine Science as a BAdvSci(Hons) specialisation, you'll take a range of core and advanced courses to explore current scientific and management issues. In-depth case studies will demonstrate the multi-disciplinary nature of the work required to solve significant marine science problems. You'll also take courses to develop quantitative skills in data exploration, modelling and statistics, as well as advanced practical research skills courses. In your fourth year you'll complete an independent research project. This will prepare you to continue on to doctoral study if you attain the required grades. Alternatively you could enter the workforce.

- ✓ BSc major or BAdvSci(Hons)
- ✓ Available in a conjoint



## Human, social and behavioural sciences

### Anthropological Science

Anthropological Science bridges the natural sciences, human sciences and humanities, allowing you to develop a deep awareness of cultural and biological diversity. This major offers you the chance to hone scientific skills and learn new technologies that will support research in bio-anthropology and archaeology.

As part of your major you will complete the Anthropological Science capstone course, ANTHRO 399, which will encourage you to make connections between your academic learning and the professional world. You'll conduct individual and group-based research with significance to a range of stakeholders, including Heritage New Zealand, Auckland Council, Auckland Museum, and iwi and hapū.

Complementary majors include Biological Sciences, Chemistry, Earth Sciences, Environmental Science, Geography, Psychology and Statistics. Anthropological Science is not available as a major in a conjoint degree.

✓ BSc major

### Exercise Sciences

See *Biological, health and life sciences*, page 14.

### Geography

See *Earth and environmental sciences*, page 19.

### Psychology

Psychology is the study of human and animal behaviour. It is a science that investigates how organisms – primarily people – think, learn, perceive, feel, interact with one another, and understand themselves. As a Psychology student you'll study a variety of approaches to the discipline, ranging from the quantitative to the qualitative and personalised, and from theoretical to practical. Modern psychologists base their theories on observable and repeatable behavioural data, ranging from counts of simple behaviour in animals to verbal

reports of emotions and feelings in humans. As a result, practical work in the laboratory or field is an essential part of this subject. Psychology is available in the BSc and the BAdvSci(Hons).

If you study Psychology as a BSc major, you'll complete a capstone course in your final year, PSYCH 399 Communicating Psychology, where you'll work independently and in small groups to communicate psychological ideas and research, using a range of media, including grant proposals, podcasts and print.

Complementary BSc majors include Anthropological Science, Biological Sciences, Chemistry, Computer Science, Exercise Sciences, Pharmacology, Physics, Physiology and Statistics.

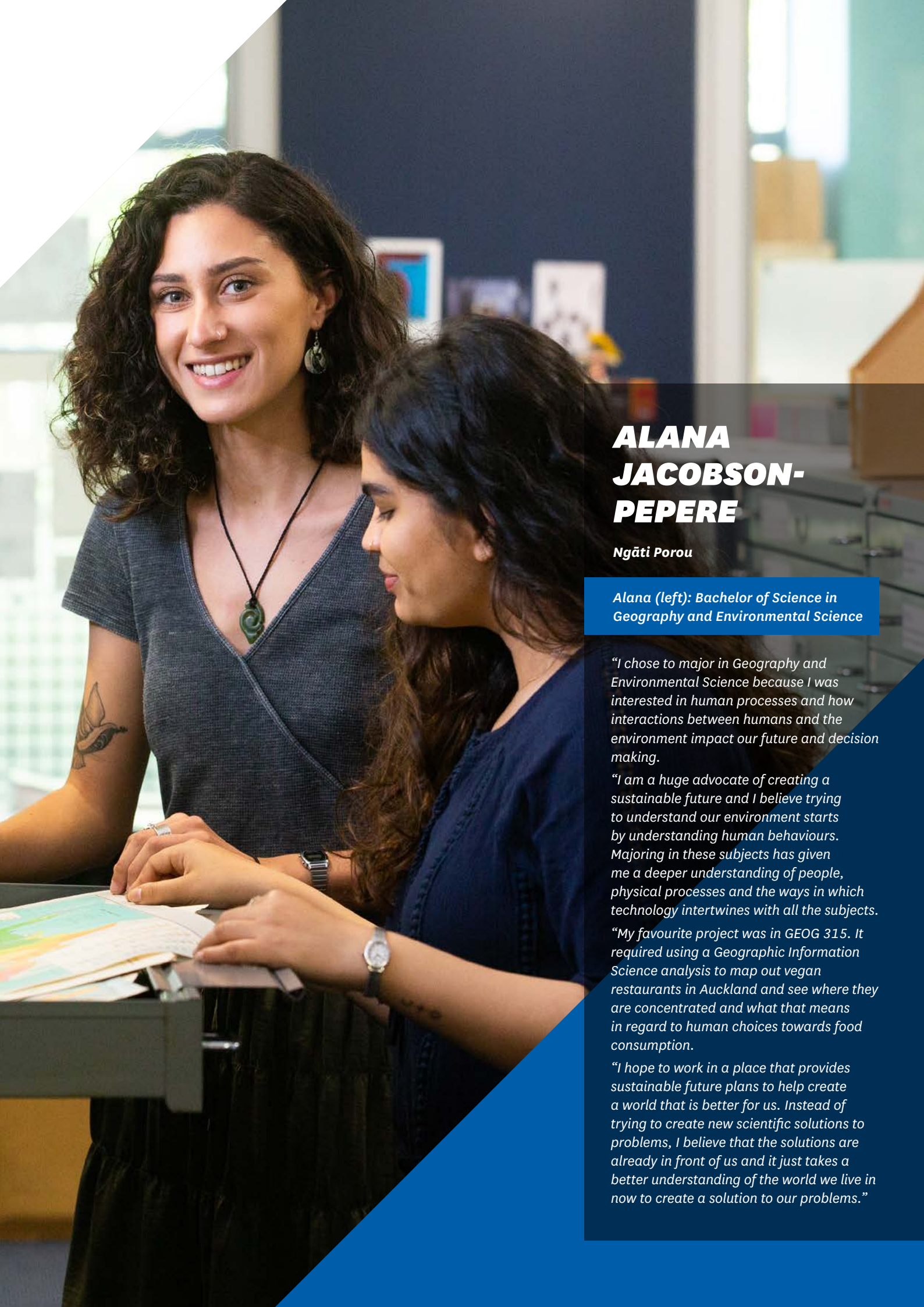
If you study Psychology as a BAdvSci(Hons) specialisation, you'll take courses from a range of disciplines, from social and applied psychology to behavioural psychology, clinical psychology, cognitive neuroscience and cultural psychology. In your second year you'll have the chance to specialise further as you take advanced courses that will prepare you for research at postgraduate level. In your fourth year you'll complete a practical research project under the direction of an academic supervisor, which will prepare you for entry into doctoral study if you attain the required grades. Alternatively you could enter the workforce.

✓ BSc major or BAdvSci(Hons)

✓ Available in a conjoint







## **ALANA JACOBSON- PEPERE**

**Ngāti Porou**

**Alana (left): Bachelor of Science in  
Geography and Environmental Science**

*"I chose to major in Geography and Environmental Science because I was interested in human processes and how interactions between humans and the environment impact our future and decision making."*

*"I am a huge advocate of creating a sustainable future and I believe trying to understand our environment starts by understanding human behaviours. Majoring in these subjects has given me a deeper understanding of people, physical processes and the ways in which technology intertwines with all the subjects."*

*"My favourite project was in GEOG 315. It required using a Geographic Information Science analysis to map out vegan restaurants in Auckland and see where they are concentrated and what that means in regard to human choices towards food consumption."*

*"I hope to work in a place that provides sustainable future plans to help create a world that is better for us. Instead of trying to create new scientific solutions to problems, I believe that the solutions are already in front of us and it just takes a better understanding of the world we live in now to create a solution to our problems."*





## Mathematical and computational sciences



### Computer Science

Computing technology permeates our lives, and with that comes the demand for specialists to imagine, develop and maintain that technology. Computers are indispensable in our lives in fields such as education, medicine, commerce and engineering – as well as leisure. We can't imagine what we would do without them, and the innovations just keep on coming. Computer Science is growing in complexity as technology itself becomes more complex, and as computers (and computational processes) become an intrinsic component in a growing number of academic and professional spheres. Computer Science is available in the BSc and the BAdvSci(Hons).

If you take Computer Science as a BSc major, you'll study topics such as artificial

intelligence, cyber security, data science, networks and the internet, software engineering, algorithms, complexity theory, computer vision, graphics, human-computer interaction, logic, programming languages and robotics.

As part of your BSc major you'll complete COMPSCI 399, the Computer Science capstone course, where you'll work in small teams on a substantial project from conception through to production. This major will allow you to develop logical thinking, problem solving, abstract thought and analysis – all skills that are highly valued by employers.

Complementary BSc majors include Information and Technology Management, Mathematics, Physics, Psychology and Statistics.

The BAdvSci(Hons) Computer Science specialisation is designed to accommodate the growing need for both deeper and broader understanding of computers. It will appeal to you if you're interested in building knowledge or capacity, or if you're keen to work in interdisciplinary areas. The specialisation has a particular focus on innovation and developing new knowledge through research activities, leading to advanced knowledge in the discipline. You'll have a broad introduction to recent research in computer science, which will prepare you to undertake your own postgraduate study.

If you study Computer Science as a BAdvSci(Hons) specialisation, you'll take six compulsory courses that cover the core areas of software development, computer systems and theory of computing. As you move into your second and third year you'll explore one of

these areas in more depth, and you'll take two advanced research courses that will prepare you to complete a research component in your final year.

- ✓ BSc major or BAdvSci(Hons)
- ✓ Available in a conjoint

### Data Science

Data Science is a rapidly growing field with an unmet demand for suitably qualified graduates. Big data is everywhere, but to extract information we require the ability to manage – and analyse – the data.

A Data Science specialisation will provide initial preparation for students wishing to pursue a career in this area. It brings together courses from Computer Science, Statistics and Mathematics to provide a strong, coherent background in the field.

You'll learn how to process data and manage databases; bring together data from disparate sources; extract information and value from data; conduct statistical and predictive modelling; and develop effective critical analysis, communication and reflective skills. As part of your specialisation you'll complete the Data Science capstone course, DATASCI 399 Creating Value from Data, where you'll work on a group-based project to showcase the skills you've gained.

- ✓ BSc specialisation



## Computational Biology

See *Biological, health and life sciences*, page 13.

## Geographic Information Science

See *Earth and environmental sciences*, page 19.

## Information and Technology Management

Information and Technology Management is a business-focused major that will appeal to you if you're interested in combining computing skills with current business practice.

You'll study the applications of technology and information management in the commercial sector, focusing on the analysis and design of information systems for business. As an Information and Technology Management student you'll take courses that allow you to understand information management from a systems, data handling, and a process perspective. As part of your major you'll complete a capstone course where you'll work in a small group to analyse a problem, devise a solution, produce a system and present your work.

Complementary majors include Computer Science, Mathematics and Statistics.

✓ BSc major

## Logic and Computation

Do you have a flexible mind capable of creative, speculative thought, precise calculation and practical problem solving? If you're interested in computer science, linguistics and philosophy, Logic and Computation could be the ideal choice for you. This major focuses on the development of computer languages, and it has strong applications in the areas of artificial intelligence, speech recognition, and associated software development.

As a Logic and Computation student you'll have the chance to gain sound practical knowledge of programming and logical analysis, and to develop the conceptual, analytical and communication skills needed for a deeper theoretical understanding of the discipline. You'll also study the philosophical and linguistic issues at the root of the science of computation. As part of your major you'll complete LOGICOMP 399, the Logic and Computation capstone course, where you can apply your learning in an individual or small-group research project based around the role of logic and computation in modern society.

Complementary majors include Computer Science, Information and Technology Management, Mathematics, Physics and Psychology.

✓ BSc major

## Mathematics

The subject of Mathematics has many faces: it can be challenging, beautiful, powerful, fascinating, and even mysterious to some people. But, above all, it is useful. Mathematics is a central science, and it interacts with many other disciplines – wherever problems need to be solved, Mathematics has a role to play. As a Mathematics student you'll study a range of concepts and theories, as well as analytical, computational and modelling tools that you can apply to areas as diverse as the biological sciences, information and physical sciences, economics, engineering and finance. Mathematics is available in the BSc and the BAdvSci(Hons).

If you study Mathematics as a BSc major you can choose to keep it general, or follow one of two Mathematics pathways in order to focus your studies further:

- **Applied Mathematics:** The study of mathematical methods that can be used to understand problems in a wide range of sciences, engineering, finance, and other industries.
- **Pure Mathematics:** The study of abstract concepts, and the development of analytical, logical and creative thinking, and problem-solving skills.

As part of your BSc major you'll complete the Mathematics capstone course where you'll





work with other students to explore the role of mathematicians in society and culture. Your project will give you the chance to develop your skills in communication, critical thinking, teaching and creative problem solving.

Complementary BSc majors include Computer Science, Data Science, Geophysics, Physics and Statistics.

If you study Mathematics as a BAdvSci(Hons) specialisation, you'll take courses across the spectrum – from algebra, combinatorics, complex analysis and differential equations to mathematical modelling, functional analysis and operator theory, the history of mathematics, numerical analysis and topology. In your final year you'll complete an independent research project under the guidance of an academic mentor. This will help to prepare you for further postgraduate study or to enter the workforce.

Mathematics is an important skill in great demand by employers – the BAdvSci(Hons) specialisation will equip you with advanced knowledge in pure and applied mathematics, as well as the computational and research skills required to make great contributions in science, technology or commerce.

- ✓ BSc major or BAdvSci(Hons)
- ✓ Available in a conjoint

## Statistics

We live in an information age. Computers allow us to collect and store information in quantities that previously would never have been dreamt of. However, data is useless until people can make sense of it. If you're interested in looking critically at numerical information without being misled, then Statistics could be the ideal subject for you.

Statistics is the human side of the computer revolution – statisticians take raw, undigested data, often in very large sets, and make sense of it to solve problems and provide valid information in almost every area of life.

As a Statistics student you'll study how to ask the right questions, how to design ways to collect and analyse data, and how to present information in meaningful ways. Statistics is available in the BSc and the BAdvSci(Hons).

If you study Statistics as a BSc major, you can choose to keep it general, or follow one of two Statistics pathways in order to focus your studies further:

- **Applied statistics:** This is for students who are primarily interested in the practice of statistics.
- **Statistics and probability:** This is for students who are interested in both the application of statistics and the theory underlying statistics and probability, including stochastic modelling. If you intend to progress to postgraduate study, you should take this pathway.

In the final year of your BSc you'll complete the Statistics capstone course, STATS 399 Statistics in Action, where you'll integrate your statistical knowledge and collaborate with other students to solve a statistical problem. Statistics complements all other BSc majors.

If you study Statistics as a BAdvSci(Hons) specialisation, you'll take courses in mathematical statistics and probability theory, as well as applied statistics and data analysis. You will also support your specialisation with advanced courses in Mathematics.

In your fourth year you'll undertake an independent research project, which will equip you with the advanced research methods you'll need for doctoral study. The deep knowledge and practical investigation skills you'll gain will develop your abilities in the art and science of extracting meaning from seemingly incomprehensible data.

- ✓ BSc major or BAdvSci(Hons)
- ✓ Available in a conjoint





## **HANNA BRAMANTO**

*Bachelor of Science in Data Science*

*"Studying Data Science gives me the best of both worlds by providing courses from both the School of Computer Science and Department of Statistics. A lot of the concepts complement each other, and so taking courses from both really hones those crucial skills that are needed in the workplace."*

*"The lecturers are incredibly approachable and supportive. They are always willing to help out, whether it is through email or office hours. And they're passionate about the subject area they are teaching."*

*"I enjoy the hands-on, practical work in the Statistics courses. Applying the theories we learn in class by fitting models and analysing datasets given in assignments enhances what we're taught in lectures. It's an entirely different experience: being told how to do something, and then actually doing it hands-on."*

*"I was fortunate to receive the University of Auckland International Student Scholarship. It definitely lightened the financial load on my family and also motivated me to study harder and do well in my courses."*

*"I enjoy doing organisational work and I'm very passionate about volunteering. I'm part of the committee for the Indonesian Students' Association and AIESEC in Auckland. These two organisations have provided me with a platform to help out in the Indonesian community in New Zealand and they provide cross-cultural exchanges for New Zealand youth. They've also helped me to hone my skills and build new friendships along the way."*





# Modules

Modules complement your subjects and enable you to add extra value to your undergraduate Science programme.

## What are modules?

A module is a grouping of three skills-based courses on a particular theme. Modules are optional. You can take one or two modules in addition to your main Science subjects. Completed modules will appear on your academic transcript.

## Why should I take a module?

Modules are designed to complement the skills you'll develop in your other Science subjects, and add extra value to your Bachelor of Science or Bachelor of Advanced Science (Honours). Modules allow you to develop and diversify your skillset for future employment.

## How do I take a module?

It's simple – all you need to do is enrol in your first course and then come in for a chat with an adviser at the Science Student Centre. We'll complete a degree planner with you to make sure you're on track to do the right courses for your module and the rest of your programme.

Science students can also choose up to one module offered by other faculties at the University.

### Science Student Centre

Phone: +64 9 923 7020

Email: [scifac@auckland.ac.nz](mailto:scifac@auckland.ac.nz)

[www.science.auckland.ac.nz/modules](http://www.science.auckland.ac.nz/modules)

## Modules available

### Data Analysis

Gain a practical understanding of applied data and statistical analysis.

### Exercising the Body and Mind

Learn about the science behind exercise and fitness.

### Quantitative Critical Thinking and Communication

Develop the ability to interpret and evaluate reports, and construct and communicate sound arguments.

### Science in Society

Acquire critical skills and understanding in communication, innovation and engagement in order to contribute to addressing societal issues.

### Science Scholars\*

Take part in one-on-one mentoring and research activities, and participate in dedicated lectures, seminars and activities.

### Software Development

Gain the skills required to plan, design and write computer programs using standard computer programming languages.

### Spatial Data Analysis

Acquire basic skills in spatial analysis, spatial data structures and the representation of spatial information.

### Studies in Food and Health

Gain scientific insights into our daily encounters with food and health; in the home, the market and the media.

### Studies in Urban Wellbeing

Gain an interdisciplinary overview of the status and dynamics of contemporary urbanism.

### Sustainability

Develop your understanding of sustainability to make an informed and positive contribution to this significant social challenge.

*\*This module is only available to students who are part of the Science Scholars programme. See Science Scholars Programme, page 30.*





# Choose your career

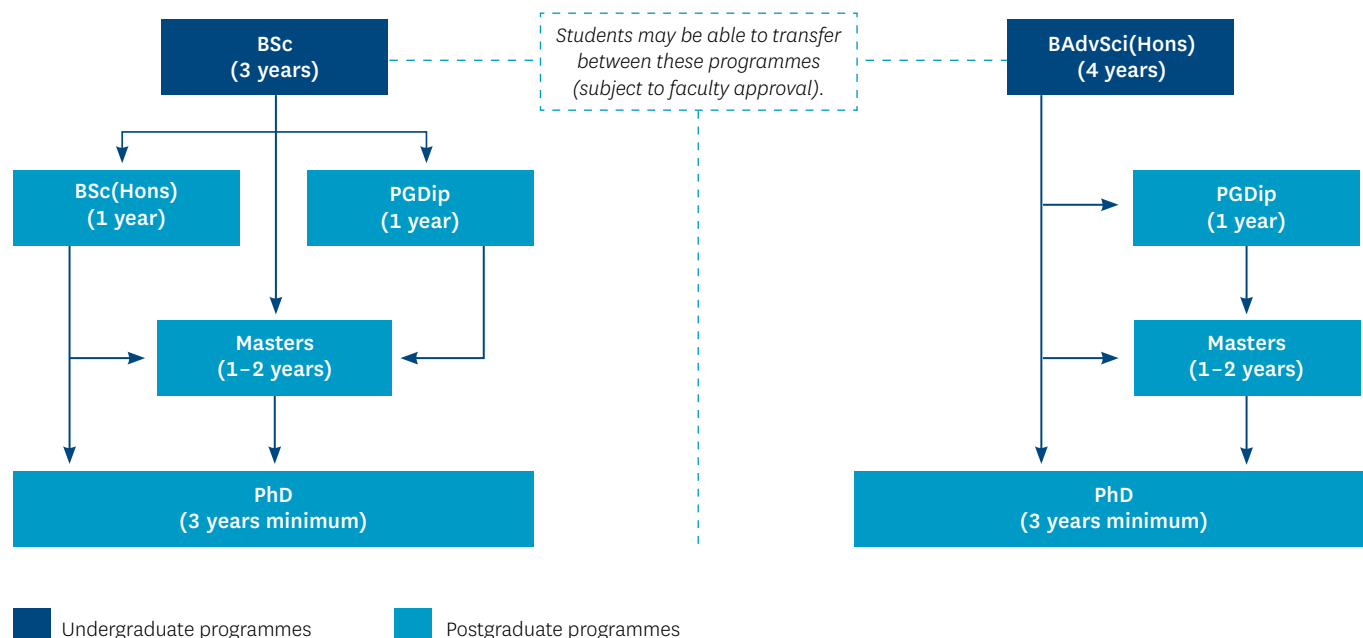
Building a career involves knowing what your skills, values, knowledge and interests are and then identifying environments where these can be maximised. A Science programme can lead to an incredibly wide range of career opportunities. Our graduates begin their careers in research organisations, local and central government, international and community organisations, education, commerce and industry.

Each of our subject areas leads to a wide range of possible career options.

| Subject area                            | Career opportunities  |
|---|---|
| Biological, health and life sciences    | Biotechnologist, drug company representative, ecologist, fisheries analyst, geneticist, health and safety professional, healthcare professional, marine biologist, medical statistician, physiologist, virologist   |
| Chemical and physical sciences          | Biochemist, clinical researcher, dietician, food safety officer, food scientist, forensic scientist, genome researcher, industrial chemist, inorganic chemist, laboratory technician, materials chemist, operations manager, organic chemist, pharmaceuticals technologist, toxicologist, wine scientist          |
| Earth and environmental sciences        | Atmospheric scientist, archaeologist, conservationist, environmental consultant, geochemist, geographer, geologist, hazards scientist, hydrologist, meteorologist, oceanographer, policy analyst, resource manager, volcanologist   |
| Human, social and behavioural sciences  | Clinical exercise physiologist, human movement scientist, human resources professional, injury prevention consultant, mental health counsellor, policy analyst, psychologist  |
| Mathematical and computational sciences | Business analyst, computer systems engineer, database developer, data scientist, economic analyst, financial analyst, merchant banker, programmer, risk management specialist, security analyst, software engineer, statistician, systems developer, telecommunications developer, traffic engineer, UX developer |

# Our postgraduate programmes

## Postgraduate pathways



## Entry requirements

To gain entry to a degree programme at the University of Auckland, you must meet admission, programme and undergraduate English language requirements. This table shows the rank score, subjects and other entry requirements that will guarantee you admission to your programme in 2021. If you achieve the University Entrance (UE) standard but do not achieve a rank score that will guarantee selection into the programme you wish to pursue, your application will be given individual consideration, provided places are available.

| Undergraduate programme admission requirements for school leavers who have achieved University Entrance.  |                |                         |    |
|---|----------------|-------------------------|----|
| Programme   | NCEA (Level 3) | Cambridge International | IB |
| Bachelor of Science (BSc)   |                |                         |    |
| – Biomedical Science  | 280            | 310                     | 33 |
| – Food Science and Nutrition  | 200            | 200                     | 28 |
| – All other majors/specialisations  | 165            | 170                     | 26 |
| Bachelor of Advanced Science (Honours) (BAdvSci(Hons))  | 260            | 310                     | 33 |
| Conjoint programmes   |                |                         |    |
| Applicants must achieve the greater of the two rank scores for their selected programmes and must meet the entry requirements for both programmes. Not all degree programmes have conjoint options. |                |                         |    |
| Bachelor of Science conjoints   | 210            | 230                     | 28 |
| Bachelor of Advanced Science (Honours) conjoints  | 275            | 330                     | 36 |





## **JUSTIN MENEZES**

**Bachelor of Science in Biomedical  
Science**

*"I chose Biomedical Science because I have always been intrigued by biology, how the body functions, and what I can do to improve people's lives and way of living. Many medical conditions are still untreatable and many have only symptomatic 'treatments', and I find that a Biomedical Science degree positions me where I can work towards solutions to some of these problems.*

*"I really enjoy the exciting range of topics available to study. Also, the lecturers are all extremely passionate about their topics and are actively researching in their fields, which means we get to learn and discuss front-line findings and research before it hits the press!*

*"Writing my first literature review, although daunting, has been one of my favourite assignments to date. It gave me a great opportunity to really showcase to my lecturers my interests in this field and to demonstrate my ability to pull together my knowledge around topics I had gone out on my own to read. It was also very exciting to read some of my peers' literature reviews, as we all chose topics that interested us.*

*"At the moment I'm still deciding where my qualification will take me. I know I can move into research but studying has opened my eyes to a world of opportunities. Currently, I am hoping to gain a postgraduate qualification before joining a research lab to hopefully be a part of the solution for many disease-affected individuals."*

# Getting involved in faculty life



## Science Mentoring Programme

In the Science Mentoring Programme, senior students volunteer their time to help new students settle into University life.

As a first-year Science student you'll be connected to a mentor on your Orientation day. Your mentor will be there to answer your questions about university life, check in with you regularly, and give tips and support for you to excel in your new journey.

[www.science.auckland.ac.nz/sciencementors](http://www.science.auckland.ac.nz/sciencementors)

## Science Students' Association

The Science Students' Association (SciSA) is a student-run organisation that all Faculty of Science students are invited to join. In addition to offering various social events throughout the year, the association runs academic workshops, research showcases, study groups and other opportunities for students to put learning into practice. Together with the faculty, this group actively creates an environment in which students' many interests are nurtured and their wellbeing is supported.

Get in touch with the Science Students' Association via their Facebook page.

[www.facebook.com/ScienceStudentsAssociation](https://www.facebook.com/ScienceStudentsAssociation)

## Science Scholars programme

Completed in conjunction with the Bachelor of Science (BSc) or Bachelor of Advanced Science (BAdvSci(Hons)), the Science Scholars programme combines one-on-one mentoring with cross-disciplinary interaction and research opportunities that aren't usually available in undergraduate study.

You'll join a select group of Science students, from across the faculty, who work closely with the University of Auckland's leading scientists and teachers to support and extend each other.

Entry to the Science Scholars Programme is competitive, and we are interested in both your potential for academic success, and your engagement with activities outside the classroom.

The programme offers selected students:

- The opportunity to be involved in special research projects
- An academic mentor for the duration of their degree
- Academic counselling, including career counselling
- Personalised invitations to seminars
- The opportunity to meet distinguished visitors
- Enrichment activities that tap into the best research-informed teaching and learning methods

Students will also be part of a vibrant, scientifically focused community, with many chances to socialise as a cohort.

[www.science.auckland.ac.nz/sciencescholars](http://www.science.auckland.ac.nz/sciencescholars)

## Tuākana Science Programme

Tuākana Science is a community open to all Māori and Pacific students. In addition to providing space to hang out, study and connect with other students, Tuākana offers opportunities at every stage of university study.

From topic-specific tutorials, one-on-one sessions, and exam preparation for undergraduate students, through to scholarships, tutoring jobs and career mentoring for senior students, Tuākana aims to extend your academic and career development so you reach your full potential.

[www.science.auckland.ac.nz/tuakana](http://www.science.auckland.ac.nz/tuakana)



Developers Society wins New Club of the Year at the 2019 Clubs Awards.





SciSA wins Best in Science at the 2019 Clubs Awards.

- Student Association for the Medical Sciences (UoASAMS)
- Society of Food Associated Disciplines (UoASOFAD)
- Auckland University CompSci Society (AUCSociety)
- University of Auckland Data Science Club (UoADSC)
- Auckland University Geoscience Association (AUGA)
- University of Auckland Marine Science Society (UMSS)
- University of Auckland Maths Club (UoAMathsClub)
- Physics Association of the University of Auckland (PAUA)
- Auckland University Psychology Students' Association (AUPSA)
- Science Students' Association (SciSA)
- Healthcare Technology Association (HTA)
- Chiasma Auckland (ChiasmaNZ)
- Developers Society (DEVs)
- Nesian Indigenous Science Student Association (NISSA)

## Rainbow Science Network

The Rainbow Science Network's vision is for an inclusive culture that acknowledges and respects all sexual orientations and gender identities and values the contribution we collectively make to the life of the Faculty of Science.

Connect with the Rainbow Science Network via their webpage.

[www.science.auckland.ac.nz/rainbowsience](http://www.science.auckland.ac.nz/rainbowsience)

## Student clubs and societies

Being involved in clubs gives you the opportunity to meet other Science students, gain new skills and develop your social and professional networks.

Connect with the following interest clubs by searching for them on Facebook.

- Auckland Archaeological Society (ArchSoc)
- Auckland University Biology Students' Association (AUBSA)





A portrait of Meg Spittal, a young woman with long brown hair, smiling. She is wearing a light pink shirt with a blue and black abstract pattern. The background is a blurred green foliage. A blue diagonal graphic element is on the right side of the page.

## MEG SPITTAL

*Bachelor of Science in Biological Sciences*

*"I've always had a passion for nature and the environment, and growing up I was surrounded by plants and animals. In high school I enjoyed Biology above everything else so I decided to delve further into it."*

*"There are many subjects available in the Biological Sciences programme – from evolution and genetics, to plant diversity and animal behaviour. Because of this, you can use your qualification and apply it to a range of jobs."*

*"In 2018 I was awarded a summer student scholarship. This was an amazing opportunity for me as I got to know some of the staff better and refine my biological skills. This really catapulted me into more opportunities, such as the summer studentship with the Auckland Botanic Gardens."*

*"This summer I am working with the Auckland Council and I hope to make many connections there. After that, I plan on taking a year off to work, then return to university and complete a Postgraduate Diploma in Science, with a focus on Entomology."*



# Dates to remember



## Saturday 29 August 2020

Open Day is all about discovering the qualifications that are right for you. You'll learn what you need to get accepted into the University, what it's like to be a student on campus, and where your study could lead you.

While you're here, make the most of the opportunity to attend lectures, meet our staff and students, experience our social culture and explore the City Campus. Travel to and from the University on free buses within Auckland and further afield.

The full programme will be available online and from your school in July. In the meantime, you can visit [www.openday.ac.nz](http://www.openday.ac.nz)

## Orientation

Orientation takes place the week before lectures start each semester. Discover all you need to know about the facilities and support services available, and choose clubs to join so you can quickly feel at home at New Zealand's leading university. Ask about UniGuides, who can personally introduce you to the University. Faculties and other groups usually hold their own Orientation activities at the beginning of each semester too.

### Semester One 2021 Orientation welcome

**General Orientation:** Week beginning 22 February 2021 (Semester One 2021 begins 1 March)

Find out more about International Orientation Week.

[www.auckland.ac.nz/internationalorientation](http://www.auckland.ac.nz/internationalorientation)

For more information call 0800 61 62 63 or email [studentinfo@auckland.ac.nz](mailto:studentinfo@auckland.ac.nz)



[www.facebook.com/science.uoa](https://www.facebook.com/science.uoa)



[twitter.com/ScienceUoA](https://twitter.com/ScienceUoA)

### Disclaimer

Although every reasonable effort is made to ensure accuracy, the information in this document is provided as only a general guide for students and is subject to alteration. All students enrolling at the University of Auckland must consult its official document, the current Calendar of the University of Auckland, to ensure that they are aware of and comply with all regulations, requirements and policies.

## Closing dates for applications for admission to Science programmes in 2021

### 1 December 2020

This is the deadline for new students to submit their Application for Admission if their 2021 programme includes Summer School courses.

### 8 December 2020

This is the deadline for new students to submit their Application for Admission if their 2021 programme includes Semester One and Semester Two courses only.

If you are a new student, only one Application for Admission is required. This form is due on either 1 December or 8 December, depending on whether you want to take Summer School courses as well.

Applications received after these dates will be considered if places are available.

## Academic year 2021

### Summer School – 2021

|                          |   |
|--------------------------|---|
| Lectures begin           | Wednesday 6 January   |
| Auckland Anniversary Day | Monday 1 February   |
| Waitangi Day             | Monday 8 February   |
| Lectures end             | Friday 12 February  |
| Study break/exams        | Study Break: Saturday 13 February<br>Exams: Monday 15 – Wednesday 17 February |
| Summer School ends       | Wednesday 17 February   |

### Semester One – 2021

|                      |  |
|----------------------|--|
| Semester One begins  | Monday 1 March   |
| Mid-semester break   | Friday 2 – Friday 16 April   |
| ANZAC Day            | Monday 26 April  |
| Graduation           | Monday 3, Wednesday 5, Friday 7 May  |
| Lectures end         | Friday 4 June  |
| Queen's Birthday     | Monday 7 June  |
| Study break/exams    | Study Break: Tuesday 8 – Wednesday 9 June<br>Exams: Thursday 10 – Monday 28 June |
| Semester One ends    | Monday 28 June   |
| Inter-semester break | Tuesday 29 June – Friday 16 July   |

### Semester Two – 2021

|                     |   |
|---------------------|---|
| Semester Two begins | Monday 19 July  |
| Mid-semester break  | Monday 30 August – Friday 3 September   |
| Graduation          | Tuesday 28 September  |
| Lectures end        | Friday 15 October   |
| Study break/exams   | Study Break: Monday 18 October<br>Exams: Tuesday 19 October – Saturday 6 November |
| Labour Day          | Monday 25 October   |
| Semester Two ends   | Saturday 6 November   |

### Semester One – 2022

|                     |                    |
|---------------------|--------------------|
| Semester One begins | Monday 28 February |
|---------------------|--------------------|

## TRESELLE RAMAN

*Bachelor of Science in Green  
Chemical Science*

*"I enjoy the challenge of studying Chemistry as it involves analytical thinking and problem solving. I also love to learn, so what better degree than Chemistry – studying atoms that literally make up everything."*

*"All different types of chemistry – organic, inorganic, physical, analytical, biochemical and green – are available at the University, which allows me to choose to either specialise or have a more general Chemistry degree. The capstone course is also great as I will have the chance to apply concepts learnt during my degree and have the opportunity to work with others on a project."*

*"The labs are so enjoyable and last year I had a fantastic Teaching Assistant who was patient, helpful and heaps of fun. I have also made friends during labs, which makes each class less stressful and brings laughs. It's also good to have people to bounce things off of whenever I'm not sure of something."*

*"The Tuākana programme is great and provides support when needed and a place to make friends. The worksheets provided by the Tuākana tutors for each subject also help me apply the content I have learnt in lectures."*

*"I grew up in Suva, Fiji. I was born in New Zealand but moved to Fiji with my family when I was six. I returned to New Zealand to attend the University of Auckland and hope to eventually return to Fiji and use what I've learnt to help in my community."*





# How to apply

So, you've made your decision about what you want to study, and now it's time to apply. What do you need to do? It's a two-step process to apply for and enrol in your chosen programme.

## First you need to apply

Complete the Application for Admission online. If you haven't already, you'll be asked to sign up for a new account. It's easy, and soon your application will be underway.

**[www.auckland.ac.nz/apply](http://www.auckland.ac.nz/apply)**

Next you'll receive an acknowledgement email asking you to provide supporting documents (and in some cases to complete other requirements\*) before your application can be assessed.

Remember, you can apply for more than one programme. You can check your application status online at any time.

Your final offer of a place depends on two things: your admission to the University (which for school leavers may depend on your final school results) and your assessment by the relevant faculty.

If your application is successful, we'll email you an offer – normally from mid-January.\*\* To accept or decline this offer, log onto

**[www.auckland.ac.nz/applynow](http://www.auckland.ac.nz/applynow)**

Some late applications may be accepted after 2020 school results are available. It is advisable, however, to apply for all programmes that you might wish to pursue before the closing date. Multiple applications are acceptable, and all applications received by the closing date will be considered when 2020 academic results are available. Late applications will be considered if places are available.

## Next you need to enrol

If you need some help with the enrolment process, take an online tutorial.

**[www.auckland.ac.nz/enrolment](http://www.auckland.ac.nz/enrolment)**

Find out more about our subjects and courses online.

**[www.science.auckland.ac.nz/programmes](http://www.science.auckland.ac.nz/programmes)**

You can also visit the Science Student Centre website.

**[www.science.auckland.ac.nz/student-centre](http://www.science.auckland.ac.nz/student-centre)**

Check out Open Day on Saturday 29 August 2020.

**[www.openday.ac.nz](http://www.openday.ac.nz)**

If you are beginning tertiary study for the first time, you may be eligible for one year of fees-free study. Check our website for more information.

**[www.auckland.ac.nz/feesfreefirstyear](http://www.auckland.ac.nz/feesfreefirstyear)**

We recommend that you enrol in your courses as soon as you've accepted your offer of a place. Remember to build your timetable by selecting courses and placing these into your enrolment cart. Validate these to insure you have no timetable clashes. If there is a timetable clash, select another time, or you may need to select another course. If everything is ok, enrol in your courses.

Stuck? At any point in the process you can find answers to your questions online at

**[www.askauckland.ac.nz](http://www.askauckland.ac.nz)**

Phone during business hours or email us:

**0800 61 62 63**

**[studentinfo@auckland.ac.nz](mailto:studentinfo@auckland.ac.nz)**

\*For some programmes, you may be required to submit supplementary information (eg, a portfolio of work, referee reports, an online form) or to attend an interview/audition.

\*\*If you are not offered a place in the programme(s) of your choice, you will receive an email outlining alternative options.



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