Science
Undergraduate Prospectus 2020

Biological Sciences | Chemical Sciences | Computer Science | Environment
Exercise Sciences | Marine Science | Mathematics | Physics | Psychology | Statistics
Welcome to the Faculty of Science

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 flexible Bachelor of Science, with its large variety of majors and specialisations; and our Bachelor of Advanced Science (Honours), a four-year, research-focused programme.

In a rapidly changing world, we offer the option to take an undergraduate programme with a research focus. The 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
Welcome to the University of Auckland
Unlimited possibilities await you
We're here to help you succeed
Are you an international student?
It's your move – life on campus
Auckland Abroad – add the world to your degree
Which campus is for you?
We'll help you find accommodation
Become part of our social network
What can you study?
How programmes of study are structured
Architecture
Arts
Commerce
Dance Studies
Education/Teaching
Engineering
Fine Arts
Health Sciences
Law
Medicine
Music
Nursing
Optometry and Vision Science
Pharmacy
Property
Science
Social Work
Sport, Health and Physical Education
Urban Planning
Double your options with a conjoint programme
A great first step
What else do you need to think about?
Making your decision
It's time to apply
How do you get in?
Other pathways to tertiary study
Academic English Language Requirement
What will it cost?
Money matters
Entry/first-year scholarships and awards
Admission for international students
Frequently asked questions
Dates to remember
Glossary

Welcome to the Faculty of Science
Why study with us?
What can you study?
Bachelor of Science (BSc)
Bachelor of Advanced Science (Honours) (BAdvSci(Hons))
Conjoint programmes
Science subjects
Biological, health and life sciences
Chemical and physical sciences
Earth and environmental sciences
Human, social and behavioural sciences
Mathematical and computational sciences
Next steps
Modules
Choose your career
Our postgraduate programmes
Entry requirements
Getting involved in faculty life
Dates to remember
How to apply
I pursued Dance Studies at the University of Auckland because of the supportive, open and family-like environment where I can confidently explore ballet, contemporary, hip-hop, cultural dance, and many more styles.

The University of Auckland is widely recognised, especially abroad, and I wanted a qualification that could open endless possibilities for me. I have the choice of becoming a teacher, professional dancer, choreographer, arts administrator, or producer.

I’ve learnt a wide range of skills and practiced applying these within professional contexts. The lecturers are incredibly supportive, helpful and knowledgeable people who have introduced me into the dance industry. They have helped push my physical and analytical practice.

The libraries have been extremely useful. They’re very accessible and provide a wide range of scholarly literature. The staff are also very helpful.

I’m able to collaborate with peers, staff and students outside of the degree in dance festivals and classes. It’s an active community with lots of things to immerse yourself in to grow and expand your thinking.

I’ve been involved with Tempo Dance Festival, Short and Sweet, the Basement Theatre and collaborations alongside lecturers Sarah Knox and Sarah Foster-Sproull. So I’ve been able to work within a professional environment, witnessing how it works and learning more about myself as a performer.

“The courses at the Faculty of Science give you a wide range of options and paths to follow.

“I knew I wanted to study Psychology, but I felt I could do more. Biology and Psychology complement each other well, and I hope that a double major will be a benefit when I apply for postgraduate study. These majors have helped me to not only understand others better, but also to understand myself.

“I really enjoyed a field trip to Rangitoto, where we studied the island’s biogeography. It allowed me to get out into the field and consider a career in ecology. This wasn’t something I had planned on studying, but it’s become something that I’m very passionate about with regards to New Zealand and its biological landscape.

“I hope to continue into the Clinical Psychology postgraduate programme at the Faculty of Science. I’d like to commit myself to a restructure of New Zealand’s mental health system, with an end goal of lowering rates of suicide and depression for all New Zealand people who suffer some form of mental illness. Specifically, for my people of Māori heritage, whose numbers in those areas require affirmative help and action.

“Studying here has facilitated my growth into a free thinking adult. The University of Auckland allows you to participate in any non-academic passions you may have. My love of music has not been restricted by my degree, and I’m still able to be creative within the University’s music production club, Beats r us, and the film association.”
Why study with us?

WE’RE NEW ZEALAND’S leading Faculty of Science*

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.

Science subjects rank in the top 100 worldwide*:

- Physics and Astronomy
- Chemistry
- Materials Sciences
- Computer Science and Information Systems
- Earth and Marine Sciences
- Mathematics
- Psychology
- Computer Systems and Design
- Engineering
- Environmental Sciences
- Chemistry

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
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

24 subjects

Take 2 majors

Keep your options open

Do a student-led capstone course

Bachelor of Advanced Science (Honours)

It takes 4 years to complete a BAdvSci(Hons)

11 specialisations

Do research with an academic mentor

Progress straight to a PhD

Study advanced material

Study a conjoint programme

Transfer between programmes*

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 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 BSc (Specialisations are not available for conjoint degrees, and you can’t double-specialise.) You can also choose a specialisation as the focus area for your BAdvSci(Hons).

*Subject to faculty approval
## Science subjects quick reference table

<table>
<thead>
<tr>
<th>Science subject</th>
<th>Available as a major in the BSc</th>
<th>Available as a specialisation in the BSc</th>
<th>Available as a specialisation in the BAdvSci(Hons)</th>
<th>Available in a conjoint</th>
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<tr>
<td>Biological, health and life sciences</td>
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<tr>
<td>Biological Sciences</td>
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<td>Biomedical Science</td>
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<td>Ecology</td>
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<td>Chemical and physical sciences</td>
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<td>Chemistry</td>
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<td>Food Science and Nutrition</td>
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<td>Geology</td>
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<td>Human, social and behavioural sciences</td>
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<td>Anthropological Science</td>
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<td>Mathematical and computational sciences</td>
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<td>Computational Biology</td>
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<td>Data Science</td>
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<td>Information and Technology Management</td>
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<td>Logic and Computation</td>
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<td>Statistics</td>
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I have always loved the ocean and I’m such a water creature. Marine Science made perfect sense for me as I want to educate myself in how I can help with conservation and perhaps get the opportunity to work with cetaceans (whales, dolphins and porpoises) to understand them better.

I chose Psychology because I have always been curious to understand what makes people behave the way they do. It’s a way for me to find a deeper understanding of myself, life experiences and how I can use this knowledge to help others who may experience similar things.

I like the variety of topics that allow us to understand the different fields we can specialise in. I find learning from the experts of these different fields, hearing about their experiences and how they got to where they are, powerfully inspiring.

My academic experience has helped me to grow and has given me the confidence to push my boundaries. I’ve learnt so much about myself, my abilities, and how powerful the mind can be. I feel particularly proud of achieving a high mark in Stage II Statistics given that Statistics is not one of my strengths!
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 2019 (Late applications will be considered if places are available.)
Classes start:
Summer School: 6 January 2020
Semester One: 2 March 2020
Semester Two: 20 July 2020
www.science.auckland.ac.nz/bsc

What you’ll be studying
In your first year:
• You should enrol in eight courses for 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 select up to 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 2019 (Late applications will be considered if places are available.)
Classes start:
  - Summer School: 6 January 2020
  - Semester One: 2 March 2020
  - Semester Two: 20 July 2020

www.science.auckland.ac.nz/badvsci-hons

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 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 enrol in eight courses:
    - 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 select up to 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) specialisations

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

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

Conjoint programmes 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 area, 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 BA/BAdvSci(Hons)
- Commerce: BCom/BSc or BCom/BAdvSci(Hons)
- Design: BDes/BSc or BDes/BAdvSci(Hons)
- Engineering: BE(Hons)/BSc or BE(Hons)/BAdvSci(Hons)
- Global Studies: BGlobalSt/BSc or BGlobalSt/BAdvSci(Hons)
- Health Sciences: BHSc/BSc or BHSc/BAdvSci(Hons)
- Law: LLB/BSc, LLB(Hons)/BSc, LLB/BAdvSci(Hons) or LLB(Hons)/BAdvSci(Hons)
- Music: BMus/BSc or BMus/BAdvSci(Hons)
- Nursing: BNurs/BSc or BNurs/BAdvSci(Hons)
- Property: BProp/BSc or BProp/BAdvSci(Hons)

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

JANICE CHONG

Bachelor of Science and Bachelor of Arts conjoint in Psychology, Chinese and Spanish.

“I chose my majors because they are ‘people-subjects’ and I wanted to understand others more. Right now we place emphasis on new technologies and being rational, but I believe that underneath this, people are the most important because it’s people that technology helps and affects.

“Many of my lecturers are world-leading researchers – they’re passionate about their area of expertise and care about their students. It’s very exciting to hear about the current developments in their fields!

“The University has many scholarships that allow students to study abroad. I’ve been lucky to receive two of these scholarships, which have allowed me to improve my language skills, explore different cultures and see the universality of love and community.

“I received the Study Abroad Scholarship of Languages and Literature to study in Spain, and the Prime Minister’s Scholarship for Asia to study in China. I also did a Summer Research Scholarship where I completed a project with a Psychology lecturer – I learnt how to improve my academic writing, and I experienced ‘behind the scenes’ of scientific research.”
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 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 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 foundation 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**: 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.

**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 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.

**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**
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 is 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, Computer Science, Physics, Physiology and Psychology and Statistics.

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 and Psychology and Statistics.

Food Science and Nutrition

See Chemical and physical sciences, page 16.

Marine Science

See Earth and environmental sciences, page 19.
“After studying elsewhere in my first year, I decided to move to the University of Auckland. I became really interested in neurology, which lead 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 life long friendships, the guidance, support and countless opportunities, both educational and social, that the University provides have allowed me to learn and grow, making 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.

Food Science and Nutrition

This challenging and prescriptive specialisation offers two distinct pathways in both Food Science and Nutrition.

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 major or BAdvSci(Hons)
✔ Available in a conjoint

✔ 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

Medical Chemistry

Medical 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 Medical 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 Medical Chemistry specialisation you’ll complete CHEM 398, the Medical Chemistry capstone course, where you’ll work independently and in small groups to investigate both currently used and potential new therapeutic agents.

✔ BSc specialisation

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.

As part of your 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.

There’s an increasing number of jobs available in the sustainability science arena. Your specialisation 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

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 whether to follow one of two 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 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 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

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

Ecology

See Biological, health and life sciences, page 13.
Environmental Science

Environmental Science aims to understand the environment using input from a wide variety of science disciplines, including 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 the activities and consequences of humans in this environment. Some geographers specialise in coastal, glacial or fluvial processes and landforms, climatology, biogeography, hydrology or environmental change. Others study regional economies, 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.

As well as plenty of opportunities to apply your skills and knowledge, in your fourth year 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.

- BSc major or 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, with scientists needing 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, with a focus on in-depth case studies to 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, or enter the workforce.

- BSc major or BAdvSci(Hons)
- Available in a conjoint
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. In the Anthropological Science capstone course 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.

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 the theoretical to the 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, or the workforce.

Exercise Sciences

See Biological, health and life sciences, page 14.

Geography

See Earth and environmental sciences, page 19.
When I came to University I wasn’t sure what to major in but quickly took a liking to Computer Science for its challenging problem solving and the possible career opportunities. I didn’t want to take random courses throughout my degree, so I decided to take on a second major and picked up Psychology in my second semester. I decided to pursue Psychology because I’m interested in learning about how people think, interact and live together.

“In the future I hope to be able to develop software that will be able to help people with everyday life.

“While some people dread it, I enjoy group projects because I’m forced to interact and work with others. You are not going to get along with everyone but if you have a strong group dynamic it doesn’t feel like you’re doing any work at all.

“I enjoy my programme because of how flexible it can be. If you’re not sure what you want to study, there’s a wide range of subjects you can choose from. You can also choose some courses outside of your faculty if you are interested in courses that are less science based. For both of my majors, it’s possible to specialise in areas of interest in the second year.

“I grew up in Dannevirke, a small town. I chose to study at the University of Auckland because I wanted to learn from the best, but I also wanted to meet new people far away from home and experience the city life in Auckland.

“University is a very significant part of your life. You will learn to appreciate your time of being a student. It may seem very challenging at first, but chances are you are not alone in thinking that and you will have a lot of support from friends, tutors, lecturers and anyone else you meet around campus. You may not know what you want to do at first and may even change majors but that’s ok. Find something that genuinely interests you and don’t be afraid to try new things, you will learn more about yourself this way. Get involved and make the most of it!”
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.

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.
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 reason on 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 to 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 which 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 whether to take one of the two pathways in Mathematics, in order to focus your major:

- **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 start to 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 whether to take one of two pathways in order to focus your major 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 applications of statistics and the theory underlying the practice of statistics and probability, including stochastic modelling. If you’re intending 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, and you’ll 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 to progress to 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
"For as long as I can remember I’ve had a strong passion for the ocean, and have dreamed of being a marine biologist from early childhood. I knew that Physics, Chemistry and the other sciences were not my forte, so Biological Sciences was a natural fit with Marine Science. The nature of a Bachelor of Science with a double major also allows me to expand my scientific horizon into either field.

"What I like most about the Marine Science programme is the opportunity to build a repertoire of skills and techniques in the field and in the laboratory. I also like how the technicians, tutors and lecturers carry with them a great passion for what they do, which is reflected in their work and teaching – and passed on to us as students.

"I’ve thoroughly enjoyed the field trips based at the Leigh Marine Laboratory, as they have given me hands-on experience and plenty of valuable practical skills that I’ll carry through with me to future studies and projects.

"I’d like to do postgraduate study, then complete a masters and ultimately a PhD. I’m really interested in focusing my future studies on ocean acidification and other climate change issues facing our marine environment.

"Taking the time to make meaningful connections with fellow students, tutors, technicians and lecturers has opened my eyes to the abundance of possibilities both within and outside of University. The Auckland University Underwater Club has been amazing in this capacity, as the wide range of students from different academic backgrounds brings together a multitude of opinions and opportunities."

Bachelor of Science in Biological Sciences and Marine Science

KIARA MARTINA LEHNERT
Modules

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

What are modules?
Modules are an exciting new feature available to all students of the Bachelor of Science and Bachelor of Advanced Science (Honours) programmes. A module is an optional grouping of three skills-based courses on a particular theme that enables you to add extra value to your undergraduate Science programme. You may take one or two modules in addition to your main subjects within the overall structure of your Science programme. Completed modules will appear on your academic transcript.

What are the benefits of taking a module?
Taking a module means you can focus on a specific, skills-based area outside of your main Science subject. Modules allow you to develop and diversify your skill set for future employment, and could enhance your career prospects.

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 will 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 Student Centre
Phone: +64 9 923 7020
Email: scicac@auckland.ac.nz

Modules available
- Data Analysis
- Exercising the Body and Mind
- Quantitative Critical Thinking and Communication
- Science in Society
- Science Scholars (only for students in the Science Scholars programme)
- Software Development
- Spatial Data Analysis
- Studies in Urban Wellbeing
- Sustainability
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.

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Career opportunities</th>
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</thead>
<tbody>
<tr>
<td>Biological, health and life sciences</td>
<td>Biotechnologist, drug company representative, ecologist, fisheries analyst, geneticist, health and safety professional, healthcare professional, marine biologist, medical statistician, physiologist, virologist</td>
</tr>
<tr>
<td>Chemical and physical sciences</td>
<td>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</td>
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<tr>
<td>Earth and environmental sciences</td>
<td>Atmospheric scientist, archaeologist, conservationist, environmental consultant, geochemist, geographer, geologist, hazards scientist, hydrologist, meteorologist, oceanographer, policy analyst, resource manager, volcanologist</td>
</tr>
<tr>
<td>Human, social and behavioural sciences</td>
<td>Clinical exercise physiologist, human movement scientist, human resources professional, injury prevention consultant, mental health counsellor, policy analyst, psychologist</td>
</tr>
<tr>
<td>Mathematical and computational sciences</td>
<td>Business analyst, computer systems engineer, database developer, data scientist, economic analyst, financial analyst, merchant banker, programmer, risk management, security analyst, software engineer, statistician, systems developer, telecommunications developer, traffic engineer, UX developer</td>
</tr>
</tbody>
</table>
"I’ve been working for the past 20 years, 10 of them in child protection. I reached a point where I couldn’t go any further and I needed a change as well as a new challenge for my brain. I also wanted to continue helping children, so I decided to retrain and go into Psychology.

Ultimately I’d like to work in the field of child psychology. Right now I’m flexible, but I’ve seen there are children in our communities in various circumstances that I think could benefit from psychological support.

“I chose the University of Auckland because it has a great reputation, and the qualifications are highly regarded by employers. I’m really enjoying the diversity of topics, and the specialist knowledge I’ve come across. I’m loving learning again!

“It’s been a challenging time, but I’m glad I’m here. The quality of teaching and the standards that need to be met make achieving a qualification that much more worthwhile. You’re never too old to learn – if you have the drive, you can achieve anything.”
Our postgraduate programmes

Postgraduate pathways

Students may be able to transfer between these programmes (subject to faculty approval)

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 2020. 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.

<table>
<thead>
<tr>
<th>Programme</th>
<th>NCEA (Level 3)</th>
<th>CIE</th>
<th>IB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science (BSc)</td>
<td>280</td>
<td>310</td>
<td>33</td>
</tr>
<tr>
<td>Biomedical Science</td>
<td>200</td>
<td>200</td>
<td>28</td>
</tr>
<tr>
<td>Exercise Sciences</td>
<td>200</td>
<td>200</td>
<td>28</td>
</tr>
<tr>
<td>Food Science and Nutrition</td>
<td>165</td>
<td>170</td>
<td>26</td>
</tr>
<tr>
<td>all other majors/specialisations</td>
<td>260</td>
<td>310</td>
<td>33</td>
</tr>
<tr>
<td>Bachelor of Advanced Science (Honours) (BAdvSci(Hons))</td>
<td>210</td>
<td>230</td>
<td>28</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Programme</th>
<th>NCEA (Level 3)</th>
<th>CIE</th>
<th>IB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science conjoints</td>
<td>275</td>
<td>330</td>
<td>36</td>
</tr>
</tbody>
</table>
Getting involved in faculty life

Science Scholars programme

The University of Auckland’s Science Scholars programme is for the best and brightest Science students from New Zealand and abroad. Selected students will have the opportunity to work closely with the University of Auckland’s leading scientists and teachers as they complete their degree, providing them with the skills needed to thrive in a science career.

Entry to the Science Scholars programme is competitive, and participants will be selected according to both their potential for academic success and their engagement in 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 programme for Māori and Pacific students

Tuākana is a mentoring programme for first-year Māori and Pacific students, which started in the Faculty of Science and has been operating across the University for 25 years.

Students who take part in the programme will have access to a network of departmental mentors who are available to offer tutorial support and course advice throughout the year. Mentors also run exam and study skills workshops to help first-year students achieve the best possible results.

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

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. This group, together with the faculty, actively creates an environment in which students’ many interests and wellbeing are supported.

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

[www.facebook.com/ScienceStudentsAssociation](http://www.facebook.com/ScienceStudentsAssociation)
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/rainbowscience

Student clubs and societies

Being involved in clubs gives you the opportunity to meet like-minded people, 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)
• 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)
• University of Auckland Geography Association (UoAGEographyAssociation)
• 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)
“I find artificial intelligence techniques such as deep neural networks and reinforcement learning really exciting and interesting.

“The best thing about the Data Science major for me is that it combines the courses in Statistics, Computer Science and Mathematics that are most relevant to understanding large and complex data sets, and distinguishes that combination from each of those disciplines alone.

“Data science is currently one of the most important areas of development in science and technology due to the explosion in the quantity and complexity of data being collected, which requires new techniques and a unique combination of skills.

“My dream is to do doctoral study in neuroscience-inspired machine-learning algorithms, and work on the development of super-intelligent machines that can help us solve our hardest problems and make everyone better off.

“I chose to study at the University of Auckland because it was the first university in New Zealand to offer a Data Science major, and it’s by far the best rated university in the country. The University is rated in the top 50 worldwide for Statistics* and the Statistics department is famous for being the birthplace of the R programming language, which is one of the most important for data science.

“I started the University of Auckland Data Science Club, and it’s given me enormous satisfaction. I’ve met heaps of lovely, intelligent, passionate people, and I’ve learnt so much about the opportunities around data science. We’ve had a lot of great events: we showed the AlphaGo documentary, and Shane Legg, cofounder of DeepMind and a University of Auckland alumnus, recorded a message for us to play alongside it. Everyone at the University has been really supportive, and we have had a lot of free pizza!”

*www.science.auckland.ac.nz/excellence
Dates to remember

Saturday 31 August 2019

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

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 2020 Orientation welcome

General Orientation: Week beginning 24 February 2020
(Semester One 2020 begins 2 March)

Find out more about International Orientation Week.
www.auckland.ac.nz/internationalorientation

For more information call 0800 61 62 63 or email studentinfo@auckland.ac.nz

www.facebook.com/science.uoa
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 admission to Science programmes in 2020

1 December 2019

This is the deadline for new students to submit their Application for Admission if their 2020 programme programme includes Summer School courses.

8 December 2019

This is the deadline for new students to submit their Application for Admission if their 2020 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 2020

Summer School – 2020

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures begin</td>
<td>Monday 6 January</td>
</tr>
<tr>
<td>Auckland Anniversary Day</td>
<td>Monday 27 January</td>
</tr>
<tr>
<td>Waitangi Day</td>
<td>Thursday 6 February</td>
</tr>
<tr>
<td>Lectures end</td>
<td>Friday 14 February</td>
</tr>
<tr>
<td>Study break/exams</td>
<td>Study Break: Saturday 15 February&lt;br&gt;Exams: Monday 17 – Wednesday 19 February</td>
</tr>
<tr>
<td>Summer School ends</td>
<td>Wednesday 19 February</td>
</tr>
</tbody>
</table>

Semester One – 2020

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester One begins</td>
<td>Monday 2 March</td>
</tr>
<tr>
<td>Mid-semester break</td>
<td>Friday 10 – Monday 27 April</td>
</tr>
<tr>
<td>ANZAC Day</td>
<td>Thursday 27 April</td>
</tr>
<tr>
<td>Graduation</td>
<td>Monday 4, Wednesday 6, Friday 8 May</td>
</tr>
<tr>
<td>Queen’s Birthday</td>
<td>Monday 1 June</td>
</tr>
<tr>
<td>Lectures end</td>
<td>Friday 5 June</td>
</tr>
<tr>
<td>Study break/exams</td>
<td>Study Break: Monday 8 – Wednesday 10 June&lt;br&gt;Exams: Thursday 11 – Monday 29 June</td>
</tr>
<tr>
<td>Semester One ends</td>
<td>Monday 29 June</td>
</tr>
<tr>
<td>Inter-semester break</td>
<td>Tuesday 30 June – Friday 17 July</td>
</tr>
</tbody>
</table>

Semester Two – 2020

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester Two begins</td>
<td>Monday 20 July</td>
</tr>
<tr>
<td>Mid-semester break</td>
<td>Monday 31 August – Friday 11 September</td>
</tr>
<tr>
<td>Graduation</td>
<td>Tuesday 22 September</td>
</tr>
<tr>
<td>Lectures end</td>
<td>Friday 23 October</td>
</tr>
<tr>
<td>Labour Day</td>
<td>Monday 26 October</td>
</tr>
<tr>
<td>Study break/exams</td>
<td>Study Break: Tuesday 27 – Wednesday 28 October&lt;br&gt;Exams: Thursday 29 October – Monday 16 November</td>
</tr>
<tr>
<td>Semester Two ends</td>
<td>Monday 16 November</td>
</tr>
</tbody>
</table>

Semester One – 2021

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester One begins</td>
<td>Monday 1 March</td>
</tr>
</tbody>
</table>
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 2018 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 2019 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 31 August 2019.

[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 ensure 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 us during business hours on 0800 61 62 63 or email 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.
“I’ve always wanted to understand how and why people think the way they do, and explore the ways in which the science can be used to help others. Statistics has always appealed to me for how it allows you to understand and make connections between large volumes of data. The majors complement each other very well, as psychological concepts can explain some of the major statistical patterns occurring in society.

“Last year we got the opportunity to work with Chemistry students developing a presentation about the fast-fashion industry. This project involved us analysing actual survey data from other University students in order to make realistic conclusions.

“We took turns presenting information, being taught about the chemical processes that make fast-fashion so dangerous and then teaching them about the psychological concepts that drive it. That situation, where two different fields worked together, gave the whole assignment a very realistic feel.

“During the second semester of last year, some psychology-related job opportunities were emailed out and I was able to land one supporting people who have intellectual disabilities. Being able to actually apply the concepts I learn in class only a couple of hours later at work really reminds me that everything I study is relevant.

“In the future I’d like to go to Toronto in Canada. Despite having arguably the best health care system in the world, they are severely lacking in mental health specialists. Being able to study in a position of demand in a highly developed city would be an amazing experience as well as potentially offering great networking and career opportunities.

“I really like that the University of Auckland is very diverse. Having so many people from different places, cultures, and lifestyles means that there’s guaranteed to be people you just click with. The huge crowds can be overwhelming at first but soon most faces become pretty familiar and everyone is as open to meeting someone new as you are.”