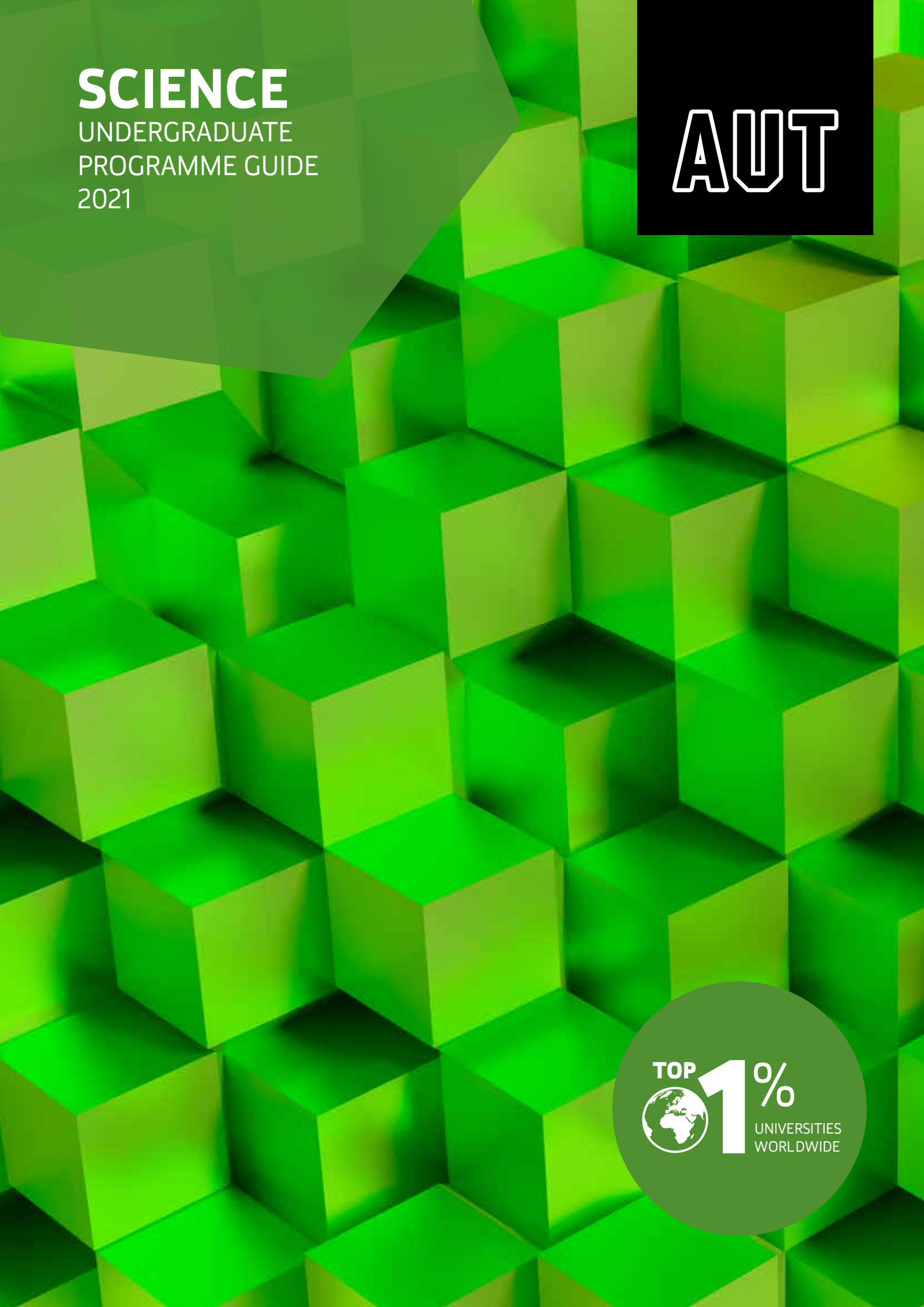
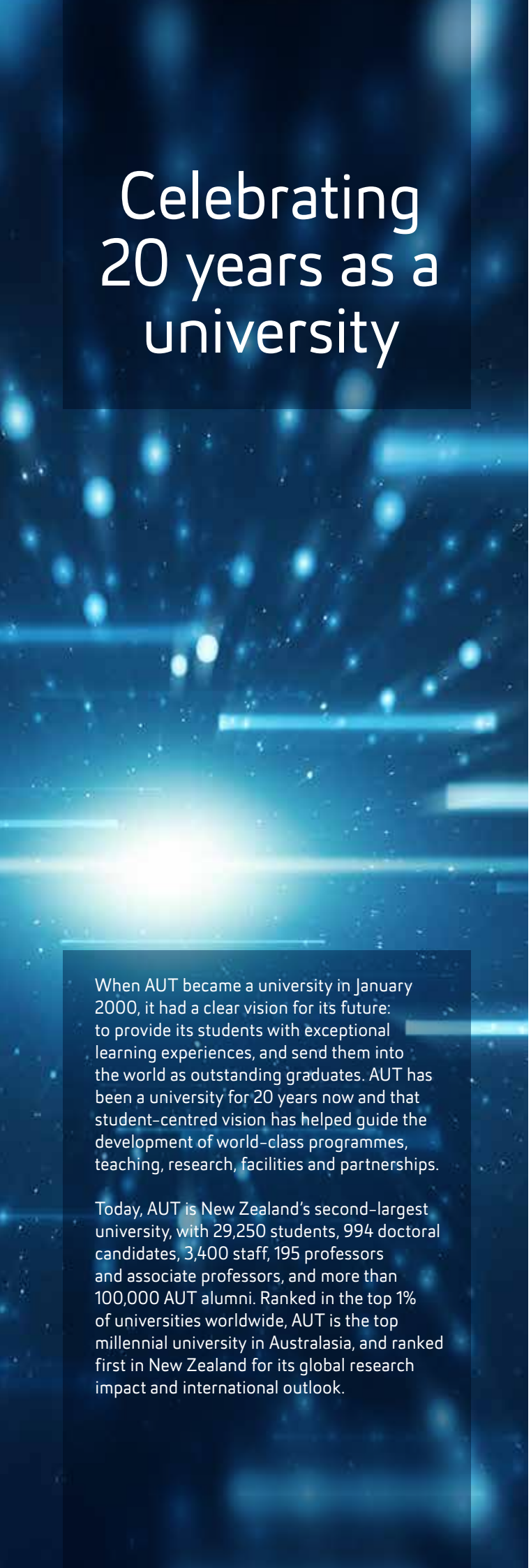
SCIENCE

UNDERGRADUATE
PROGRAMME GUIDE
2021

AUT





Celebrating 20 years as a university

When AUT became a university in January 2000, it had a clear vision for its future: to provide its students with exceptional learning experiences, and send them into the world as outstanding graduates. AUT has been a university for 20 years now and that student-centred vision has helped guide the development of world-class programmes, teaching, research, facilities and partnerships.

Today, AUT is New Zealand's second-largest university, with 29,250 students, 994 doctoral candidates, 3,400 staff, 195 professors and associate professors, and more than 100,000 AUT alumni. Ranked in the top 1% of universities worldwide, AUT is the top millennial university in Australasia, and ranked first in New Zealand for its global research impact and international outlook.

Welcome to AUT

E ngā mana, e ngā reo
E te iti, e te rahi
E ngā mātāwaka o ngā tōpito o te ao
Ngā mahuetanga iho e kawe nei i ngā
moemoeā o rātou mā
Tēnā koutou katoa

Piki mai rā, kake mai rā,
Nau mai, haere mai ki tēnei o ngā wānanga
Whakatau mai i raro i te korowai āhuru
o Te Wānanga
Aronui o Tāmaki Makau Rau

To the prestigious, the many voices
The few, the great
To those of all races and creeds
We who remain to fulfil the dreams and
aspirations of the ancestors
Greetings one and all

Climb, ascend
Embark on the journey of knowledge
Let us at AUT embrace and empower you
To strive for and achieve excellence

Te whakatupu i te kōunga, i te mana taurite me ngā tikanga matatika, i ngā pūkenga ako, i ngā pūkenga whakaako me te āta rangahau hei hāpai i ngā hāpori whānui o te motu, otirā, o te ao.

To foster excellence, equity and ethics in learning, teaching, research and scholarship, and in so doing serve our regional, national and international communities.

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About AUT

Applying for your programme

Key: F/T = full-time, P/T = part-time

Cover credit: Rendering by Jared Patterson.
Top 1%: AUT is ranked in the world's top 251–300 universities (Times Higher Education World University Rankings 2020).

AUT's faculties and schools

AUT has five faculties and 17 schools. The light green box in the diagram below shows where the programmes in this programme guide sit within AUT.

FACULTY OF BUSINESS, ECONOMICS AND LAW
TE ARA PAKIHI, TE ŌHANGA ME TE TURE

- Business School
  Te Kura Kaipakihi
- Law School
  Te Kura Ture
- School of Economics
  Matauranga Ōhanga

FACULTY OF CULTURE AND SOCIETY
TE ARA KETE ARONUI

- School of Education
  Te Kura Mātauranga
- School of Hospitality and Tourism
  Te Kura Taurimatanga me te Mahi Tāpoi
- School of Language and Culture
  Te Kura Reo me te Ahurea
- School of Social Sciences and Public Policy
  Te Kura Pūtaiao ā-iwi me ngā Kaupapa Tūmatanui

FACULTY OF DESIGN AND CREATIVE TECHNOLOGIES
TE ARA AUAHA

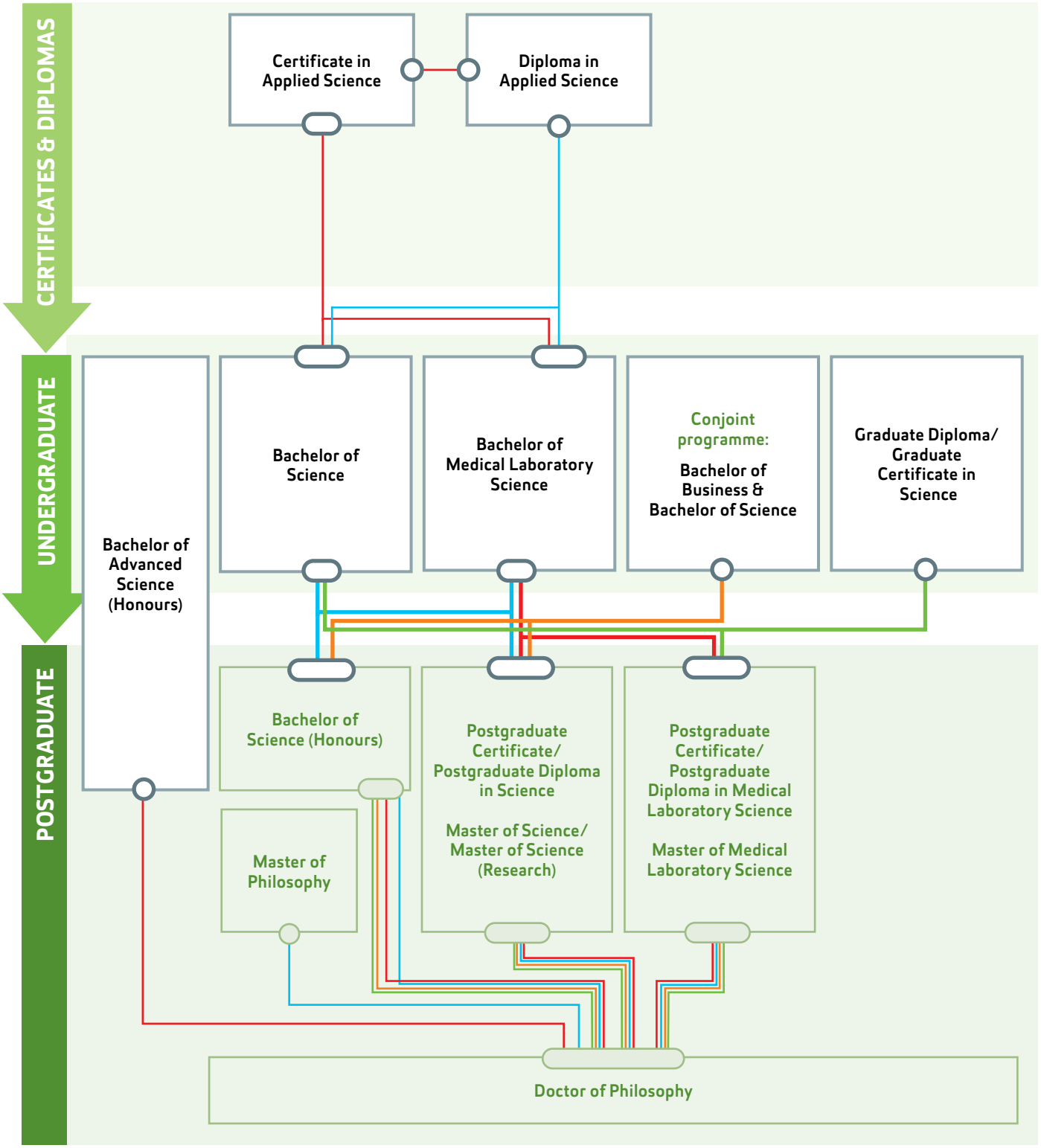
- School of Art and Design
  Te Kura Toi a Hoahoa
- School of Communication Studies
  Te Kura Whakapāho
- School of Engineering, Computer and Mathematical Sciences
  Te Kura Mātai Pūhanga, Rorohiko, Pāngarau
- School of Future Environments
  Huri te Ao

FACULTY OF HEALTH AND ENVIRONMENTAL SCIENCES
TE ARA HAUORA A PŪTAIAO

- School of Clinical Sciences
  Te Kura Mātai Haumanu
- School of Interprofessional Health Studies
  Te Kura Pākeho Ngaiotanga o Ngā Marau Akoranga Hauora
- School of Public Health and Psychosocial Studies
  Te Kura Hauora Tūmatanui
- **School of Science**
  Te Kura Pūtaiao
- School of Sport and Recreation
  Te Kura Hākinakina

TE ARA POUTAMA
FACULTY OF MĀORI AND INDIGENOUS DEVELOPMENT

Qualifications and study pathways



Note:

1) Completion of one qualification doesn't guarantee entry to a higher-level qualification.

2) Apply for the qualification you are best suited for – you don't necessarily have to enrol in the qualification that appears at the top of the above diagram.

3) Some qualifications in the above diagram may be prerequisites to – and not credit towards – higher-level qualifications.

For more information, visit aut.ac.nz/sciences

WHY STUDY SCIENCE?

Study science majors not available anywhere else in NZ

Nationally and internationally recognised lecturers

Get out of the classroom with our science field trips as far as the Antarctic

1 Our annual field trip to the Solomon Islands is one of many ways our students can hone their skills 2 AUT researchers have used drones to monitor remote and unique ecosystems from Antarctica to Africa 3 The AUT City Campus in the heart of Auckland City

World-class teaching and learning

We're proud to be one of the world's best modern universities – Times Higher Education has ranked us as the top millennial university in Australasia and number 14 in the world. We have been a university since 2000, and are now the second largest in the country and ranked among the top 1% (251–300) of universities in the world. Study science with us and you'll be prepared for rewarding careers in a wide range of industries and professions. If you want a university with future-focused teaching, an engaging learning environment that embraces people and ideas, and programmes designed for rewarding careers – then welcome to AUT.

Creating world-ready graduates

AUT's mission is to create great graduates, and AUT science graduates excel in shaping successful careers in many scientific fields, in New Zealand and around the world. We encourage innovation and entrepreneurship, and the ability to explore new technologies, challenge routine thinking and solve problems in new ways. Through our mentor programme every student also meets regularly with an academic in small groups of five to six students throughout their entire degree. We're also proud of our strong partnerships with key industry organisations like the Department of Conservation, Department of Primary Industries, Auckland Council, New Zealand Antarctic Research Institute, Roche Diagnostics, Fonterra and many more. Our collaborations with employers provide you with invaluable networking opportunities and ensure that your programme is relevant to your career, making it easy to move from your studies to the working world.

Innovative and relevant research

AUT is ranked first in New Zealand for global research impact by Times Higher Education. Our research is focused on key scientific issues of regional and global significance, and our globally renowned researchers are experts in areas as diverse as applied ecology, chemistry, biomedical science and food science. The common theme connecting all of our research is sustainability as it relates to environmental and human wellbeing. You could also conduct your research in close collaboration with our Centre for Food Science or Institute for Applied Ecology New Zealand. Our research also feeds back into the classroom, and students can contribute to and learn from these research discoveries.

Top facilities and equipment

Our outstanding laboratories include the AUT Roche Diagnostics Laboratory – which has state-of-the-art medical and biomedical testing equipment, and is the only university lab of its kind in New Zealand. To carry out their research and learning, our staff and students have access to top facilities and equipment, often rivalling technology found in large industrial enterprises. For example, our school was the first in New Zealand to own and operate a fully auto-piloted unmanned airplane for GIS referencing surveying and 3D modelling. We also have the most advanced gene sequencing machine in New Zealand.

Life at AUT

AUT is a modern and innovative university with endless opportunities and a supportive culture that celebrates diversity. Studying at AUT is your chance to meet new people and develop lifelong skills, while getting the support you need to succeed at university and beyond.

We're proactive in enabling all students to succeed, and our comprehensive student support services ensure that you have an amazing experience inside and outside the classroom.

We're here to help

No matter what the problem, our Student Hub advisors are here to help. You can find a Student Hub on each campus and our specialist staff can help with anything from enrolment and student ID cards to academic advice, fees and financial support, and services for our diverse student communities including the international, disability and rainbow community.

Dedicated support for new students

From Orientation to our many academic and cultural support programmes, our Student Services team is there to make starting out as a new student as easy as possible.

Creating career-ready graduates

The AUT Employability and Careers team helps you plan in advance for your future career by developing job search and interview skills, while building your personal brand and networking skills. We'll also introduce you to employers looking to recruit AUT graduates.

Gain an edge on the competition

The AUT Edge Award and Beyond AUT Award challenge, reward and formally acknowledge the 'C skills' – collaboration, co-operation, community, curiosity, communication and creativity – gained through your volunteering, leadership and employability activities.

International study opportunities

An international student exchange offers an amazing opportunity to study overseas as part of your degree. Study for a semester or a year at one of our partner universities around the world, immerse yourself in another culture, make lifelong friends and get international experience before you graduate.

Helping you succeed in your studies

Our library and learning support team offers a wide range of services and resources designed to help develop your academic skills.
The Library also runs a range of workshops to help you get the most out of your studies, and our peer mentoring programme enables students to learn from others who have already completed the same paper.

Top internships around the world

A good internship can be the foundation of a great career. That's why AUT Internz places students and graduates with top companies in New Zealand, North America, Asia and Europe – including Paramount Recording Studios, the Sundance Institute and Westpac Institutional Bank in New York.

A launchpad for entrepreneurs

Every entrepreneur starts somewhere.
At AUT, the best place for aspiring entrepreneurs is CO.STARTERS@AUT. This nine-week programme helps you turn your entrepreneurial ideas into a viable business.

An outstanding learning environment

At AUT you study in an innovative and interactive environment that embraces creativity, collaboration, and the sharing of ideas and culture. A number of our buildings have won prestigious architecture awards, and we're constantly improving our built environment to offer students the best possible learning experience.

Free access to digital tools and resources

We offer students all the digital tools needed to succeed, including free Wi-Fi on campus, the full Office 365 suite for up to five devices and free access to LinkedIn Learning (lynda.com), a world-leading online learning platform.

Getting involved in campus life

Joining a club is a great way to meet like-minded people and make lifelong friends outside of lectures. Choose from a range of student-run social, sustainability, academic and cultural clubs – a great way to meet new people, participate in events and get involved in campus life.

Join a gym or sports team

AUT is New Zealand's leading sports university, with state-of-the-art sports facilities, on-campus gyms, and a huge number of sports teams and events. As an AUT student you can participate in a wide variety of sports, from social on-campus games to elite international competitions.

Holistic approach to wellness

AUT offers comprehensive medical, and counselling and mental health services. We also run Wiser at AUT events where students can develop better self-knowledge and a greater sense of purpose and meaning in their lives.

Disability student support and resources

Our Disability Support team is committed to helping you participate as fully as you can in learning and student life. We work with students before they start at AUT to help identify their specific needs and ensure they're set up for success.

Getting around

Whether it's finding your way to campus or getting around between lectures, AUT offers a range of resources to help you navigate your new environment, including shuttle buses that travel between campuses and interactive online maps.

Safe and friendly campuses

We make sure our students are safe when they're on campus. Our friendly security staff are available day and night to help if you have any concerns.

Practical experience during your study

AUT science graduates have a reputation for being well-prepared for their career because they not only have a sound theoretical understanding of their discipline but have also developed practical skills that set them apart from other graduates.

You study in an interactive environment and frequently get out of the classroom to apply your knowledge. You might find yourself diving in the ocean to examine marine life, investigating forest dynamics on Mt Ruapehu, testing food products in our food sensory suite or carrying out analyses in laboratories. There are no fees for our field trips, unlike at other universities[1].

In your final year you might also be involved in an industry placement or work on an industry-related project.

Companies or research organisations involved include:

- AgResearch
- Auckland Council
- Department of Conservation
- District health boards across New Zealand
- Drapac Co. (NZ)
- Future Cuisine Ltd
- Goodman Fielder
- IGENZ
- LabPLUS
- Labtests NZ
- Liggins Institute
- McCowley Enterprises Ltd
- Merit Meats Ltd
- New Zealand Blood Service
- New Zealand Premium Whitebait Ltd
- NIWA
- OceaNZ Blue
- Olivado NZ
- Pathology Associates
- Sanitas NZ
- SCION (Rotorua)
- Tegel
- Thoughtgroup Ltd

1. There are no fees for our field trips, except for the field trip to the Solomon Islands as part of the Pacific Islands Coastal Ecology elective paper.

Shamsia (Sara) Askari
Bachelor of Science (Honours) student
Bachelor of Science in Food Science

"I chose to study science at AUT because it stood out against other universities, and had the advantage of including practical experiences. One of the highlights of my studies has been the opportunity to be the first AUT student intern at Goodman Fielder. This practical experience combined with my honours degree is a great start to my career. My goal after university is to become a contributing food scientist. As the famous quote says, 'We are what we eat'. Once I complete my Bachelor of Science (Honours), I would like to develop my career in the field of product development and help lead a healthy future of the food industry."

Bachelor of Science [BSc | AK1041] Overview

Studying a Bachelor of Science is guaranteed to ignite your passion for knowledge about the world, and will be the start of a lifelong career in science. Study with us and you have access to some of the best lecturers in New Zealand, and state-of-the-art equipment, including the most advanced gene sequencing machine in New Zealand and the AUT Roche Diagnostics Laboratory, the first of its kind in New Zealand. You'll have lots of opportunities to apply your knowledge in the lab or on field trips that span forests, mountains, and marine and freshwater environments. Our strong links with the scientific community extend right across the world – making it easy for you to transition from university to your career.

Entry requirements

Minimum entry requirements

University Entrance or equivalent

English language requirements

IELTS (Academic) 6.0 overall with all bands 5.5 or higher; or equivalent.

Useful New Zealand school subjects

- **Applied Conservation, Environmental Sciences, Marine Biology majors:** Biology and other science subjects
- **Biomedical Science, Food Safety, Microbiology, Molecular Genetics majors:** Biology, Level 3 Chemistry and other science subjects
- **Chemistry, Food Science majors:** Level 3 Chemistry, Mathematics and other science subjects
- **Geoscience, Geospatial Science, Health Protection, Psychology majors:** Science subjects

Don't meet the entry requirements?

Consider starting with our Certificate in Applied Science.

Majors

- Applied Conservation
- Biomedical Science
- Chemistry
- Environmental Sciences
- Food Safety
- Food Science
- Geoscience
- Geospatial Science
- Health Protection
- Marine Biology
- Microbiology
- Molecular Genetics
- Psychology

You can also select any two of these majors (called a double major), or complete the Bachelor of Science without a major (standard pathway).

QUICK FACTS

Level:	7
Points:	360
Duration:	3 years F/T, 6 years P/T[1]
Campus:	City
Starts:	22 Feb & 12 July 2021

Sarah McFarlane
Microbiologist, DB Breweries
Bachelor of Science in Microbiology

"My dad got me interested in homebrewing, and I soon discovered that I was really passionate about yeast and bacteria. It's fascinating how something so small can have a big impact on things. I enjoyed studying science in high school, and had passionate teachers who encouraged me to further my study and pursue a science degree at university. In my final year at AUT I undertook a research project to explore how different yeast affects beer. I enjoyed that I was able to research something I was passionate about and could apply the knowledge that I had learnt throughout my degree. My role now is a mix of working in the lab and the brewery to ensure the quality of the beer DB Breweries produces. I love that I'm part of creating something that people enjoy drinking, and that there is always something new going on at work."

Bachelor of Science [BSc | AK1041]
Overview continued

Study science majors not available anywhere else in NZ

Jeremy Li
China
Aquaculture Technician, Manāki Premium New Zealand Whitebait
Bachelor of Science in Environmental Sciences and Marine Biology

"I decided to study at AUT because it is well-known as one of the fastest growing universities in New Zealand and is known for connecting students with employers by providing lots of opportunities to intern or volunteer. By studying science at AUT you'll have lots of opportunities to work in laboratories and go on field trips. I would definitely recommend this programme because you don't just learn from the textbook but can investigate marine life in almost every paper. In your last year, I strongly recommend that you take the research project paper. In this paper, you need to choose a topic you're interested in or that is related to the career that you want to be involved in. This could impress your future employer. Before I even graduated from AUT, I was offered a role at Manāki Premium New Zealand Whitebait, the first whitebait farm in New Zealand."

What this qualification covers

Year 1

All students take the papers Health and Environment, and Knowledge, Enquiry and Communication (or equivalent), plus six other papers depending on your major(s).

Year 2 & 3

In Year 2, you start to specialise in your major and can choose elective papers that help you develop a deeper understanding of your major. In Year 3, you can enrol in the Research Project paper if you have a B grade average in 60 points at level 6. This may involve working alongside an organisation related to your major or undertaking a mini research project relevant to the needs of employers. This is unique to the AUT Bachelor of Science – it's not offered at other universities and gives you the all-important competitive edge for your career. The Research Project is also good preparation for postgraduate study. As in Year 2, there are compulsory papers for the major(s) plus a range of elective papers you can select.

Double your career options – study science and:

- Bachelor of Business (conjoint)

Today, standing out from the crowd is more important than ever. Conjoint programmes double your knowledge and opportunities, but don't take double the time to complete. You study two degrees at the same time in a single programme of study. It's usually possible to complete two three-year degrees in four to five years. You need to maintain a B grade average across all papers and do papers from each degree every year.

Scholarships

We offer competitive scholarships for the first year of the Bachelor of Science, one for every major. AUT also offers a number of other scholarships, including the Vice-Chancellor's Scholarship, which many of our science students have received. For more information visit **aut.ac.nz/scholarships**

AUT encourages early application. Places are limited[2].

1. You can change from full-time to part-time at any point in your study.
2. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

Course planner – Bachelor of Science

The Bachelor of Science is 360 points. If you study full-time you usually complete eight 15-point papers a year (a total of 120 points). You need at least 150 points at levels 6 and 7, with at least 75 points at level 7. There is also a Bachelor of Science with no major (standard pathway) available.

MAJORS	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)
Compulsory paper for all majors[1]	Knowledge, Enquiry & Communication		
Applied Conservation	Plants & Animals Ecology & Evolution Biological Sampling & Interpretation Human Geography Health & Environment AT LEAST TWO OF: • Principles of Chemistry • Biophysics • Microbiology • Biological Chemistry • Biodiversity • Our Dynamic Earth	Environmental Law Research Techniques Geographic Information Systems Biogeography Conservation Planning TWO OF: • Freshwater Ecology • Terrestrial Ecology • Fish & Aquatic Plants • Marine Invertebrates • Plant & Animal Taxonomy PLUS 1 elective	Applied Conservation Ecosystem Management Socio-ecological Systems PLUS 5 electives OR 3 electives & Research Project
Biomedical Science	Principles of Chemistry Biological & Solution Chemistry Microbiology Biological Sampling & Interpretation Health & Environment Human Anatomy and Physiology I PLUS 1 elective	Analytical Chemistry Human Anatomy & Physiology II Methods of Research & Enquiry Cells, Genes & Molecules Biochemistry PLUS 3 electives	Pharmacology for Professional Practice Natural Compounds Biomedical Science Biomedical Technology PLUS 4 electives OR 2 electives & Research Project
Chemistry	Health & Environment Principles of Chemistry Biological & Solution Chemistry Biophysics PLUS 3 electives	FOUR OF: • Analytical Chemistry • Physical Chemistry • Biochemistry • Organic Chemistry • Inorganic Chemistry PLUS 4 electives	THREE OF: • Surfaces, Colloids & Nanotechnology • Advanced Inorganic Chemistry • Advanced Analytical Chemistry • Organic Synthesis & Molecular Design • Protein & Metabolic Chemistry PLUS 5 electives OR 3 electives & Research Project
Environmental Sciences	Health & Environment Plants & Animals Ecology & Evolution Biological Sampling & Interpretation THREE OF: • Biodiversity • Principles of Chemistry • Biological Chemistry • Microbiology • Biophysics • Our Dynamic Earth • Human Geography	Environmental Risk Assessment Terrestrial Ecology Environmental Law Freshwater Ecology Research Techniques PLUS 3 electives	Plant Ecology Ecosystem Management Animal Behaviour & Ecology PLUS 5 electives OR 3 electives & Research Project
Food Safety	Health & Environment Principles of Chemistry Food Science Biological & Solution Chemistry Microbiology Biological Sampling & Interpretation PLUS 1 elective	Environmental Risk Assessment Analytical Chemistry Food Microbiology Communicable Diseases Research Techniques PLUS 3 electives	Food Industry Legislation Food Safety Systems Health Protection Advanced Food Microbiology PLUS 4 electives OR 2 electives & Research Project
Food Science	Health & Environment Principles of Chemistry Food Science Biological & Solution Chemistry Biophysics Microbiology Biological Sampling & Interpretation	Analytical Chemistry Food Microbiology Food Process Engineering Food Technology Food Chemistry PLUS 3 electives	Advanced Food Microbiology Advanced Food Chemistry Sensory Evaluation PLUS 5 electives OR 4 electives & Food Product Development OR 3 electives & Research Project

1. Or equivalent, depending on your chosen major.

Refer to the next page for more majors and papers.

Course planner – Bachelor of Science continued

MAJORS	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)
Geoscience	Health & Environment or Hauora Māori & Environment Biological Sampling & Interpretation Principles of Chemistry Our Dynamic Earth Ecology & Evolution PLUS AT LEAST TWO OF: • Introductory Astronomy • Biological & Solution Chemistry • Biophysics • Biodiversity • Human Geography • Microbiology • Plants & Animals	Geology, Landscape & Environment Environmental Risk Assessment Research Techniques Geographic Information Systems Sedimentary Rocks & Environments PLUS 3 electives	AT LEAST THREE OF: • Remote Sensing • Oceanography • Structural Geology & Tectonics • Earth Materials • Geohazards & Risk • Volcanology PLUS 5 electives OR 3 electives & Research Project
Geospatial Science	Health & Environment Plants & Animals Ecology & Evolution Biological Sampling & Interpretation Our Dynamic Earth or Human Geography PLUS AT LEAST TWO OF: • Principles of Chemistry • Biophysics • Microbiology • Biological & Solution Chemistry • Biodiversity	Environmental Law Research Techniques Geographic Information Systems Biogeography Planning for Environmental Sustainability PLUS 3 electives	Geospatial Analysis Remote Sensing Ecosystem Management PLUS 5 electives OR 3 electives & Research Project
Health Protection	Health & Environment Principles of Chemistry Plants & Animals Microbiology Biological Sampling & Interpretation Epidemiology PLUS AT LEAST ONE FROM: • Biodiversity • Physical & Human Geography • Biological & Solution Chemistry • Ecology & Evolution • Biophysics • Food Science	Environmental Risk Assessment Food Microbiology Environmental Health Environmental Microbiology Geographic Information Systems Communicable Diseases PLUS 2 electives	Geospatial Analysis Advanced Food Microbiology Health Protection PLUS 5 electives OR 3 electives & Research Project
Marine Biology	Health & Environment Plants & Animals Ecology & Evolution Biological Sampling & Interpretation PLUS AT LEAST THREE OF: • Biodiversity • Our Dynamic Earth • Principles of Chemistry • Biophysics • Microbiology • Biological & Solution Chemistry • Human Geography	Fish & Aquatic Plants Marine Invertebrates Research Techniques Environmental Law PLUS 4 electives	Marine Ecology Ecological Management & Modelling Oceanography PLUS 5 electives OR 3 electives & Research Project
Microbiology	Health & Environment Microbiology Biological & Solution Chemistry Ecology & Evolution Principles of Chemistry PLUS AT LEAST TWO OF: • Biodiversity • Food Science • Biophysics • Biological Sampling & Interpretation • Human Geography • Plants & Animals	Environmental Microbiology Food Microbiology Biochemistry Principles of Genetics Industrial Microbiology Cells, Genes & Molecules PLUS 2 electives	Advanced Food Microbiology Biotechnology Molecular Genetics PLUS 5 electives OR 3 electives & Research Project
Molecular Genetics	Health & Environment or Hauora Māori & Environment Microbiology Biological & Solution Chemistry Biological Sampling & Interpretation Principles of Chemistry PLUS AT LEAST TWO OF: • Plants & Animals • Ecology & Evolution • Biodiversity • Our Dynamic Earth • Human Geography • Biophysics	Principles of Genetics Research Techniques Biochemistry Cells, Genes & Molecules PLUS 4 electives	THREE OF: • Protein and Metabolic Chemistry • Molecular Genetics • Molecular Diagnostics • Computational Genetics • Microbial Genetics PLUS 5 electives OR 3 electives & Research Project

MAJORS	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)
Psychology	Health & Environment or Hauora Māori & Environment Biological Sampling & Interpretation Introduction to Psychology B Introduction to Psychology A PLUS AT LEAST TWO OF: • Plants & Animals • Principles of Chemistry • Biological & Solution Chemistry • Ecology & Evolution • Biodiversity • Our Dynamic Earth • Human Geography • Human Anatomy & Physiology I PLUS 1 elective	Research Techniques AND AT LEAST THREE OF: • Individuals & Identities • Psychological Assessment • Brain & Behaviour • Cognitive Psychology • Abnormal Psychology • Social Psychology • Personality PLUS 4 electives	AT LEAST THREE OF: • Emotions & Human Nature • Experimental & Applied Behaviour Analysis • Critical Evaluation in Psychology • Biopsychology • Positive Psychology • Applied Issues in Cultural & Social Psychology • Experimental & Applied Behaviour Analysis II • Health Psychology • Approaches to Psychological Intervention • Advanced Research Methods in Psychology PLUS 5 electives OR 3 electives & Research Project

Elective papers

In all majors you can complete elective papers as part of your study. Some papers have prerequisites. Other elective papers may also be available – refer to aut.ac.nz/calendar

Level 5 (Year 1) elective papers

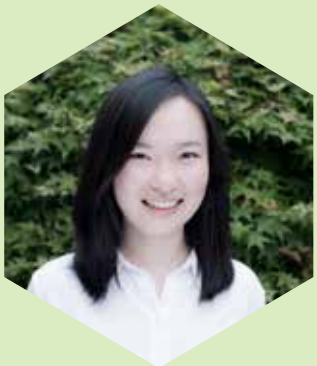
- Biodiversity
- Biological & Solution Chemistry
- Biological Sampling & Interpretation
- Biophysics
- Ecology & Evolution
- Epidemiology, Histology & Cytology
- Food Science
- Health & Environment
- Human Anatomy & Physiology I
- Human Geography
- Introduction to Psychology A
- Introduction to Psychology B
- Microbiology
- Our Dynamic Earth
- Plants & Animals
- Principles of Chemistry

Level 6

- Analytical Chemistry
- Aquaculture
- Biochemistry
- Biogeography
- Brain & Behaviour
- Cells, Genes & Molecules
- Cognitive Psychology
- Communicable Diseases
- Conservation Planning
- Environmental Health
- Environmental Law
- Environmental Microbiology
- Environmental Risk Assessment
- Fish & Aquatic Plants
- Food Chemistry
- Food Microbiology
- Food Process Engineering
- Food Technology
- Freshwater Ecology
- Geographic Information Systems (GIS)
- Geology, Landscape & Environment
- Inorganic Chemistry
- Industrial Microbiology
- Marine Invertebrates
- Medical Microbiology I
- Organic Chemistry
- Physical Chemistry
- Planning for Environmental Sustainability
- Plant & Animal Taxonomy
- Principles of Genetics
- Research Techniques
- Sedimentary Rocks & Environments
- Social Psychology
- Terrestrial Ecology

Level 7

- Advanced Analytical Chemistry
- Advanced Food Chemistry
- Animal Behaviour & Ecology
- Applied Conservation
- Biomedical Science
- Biomedical Technology
- Biotechnology
- Computational Genetics
- Earth Materials
- Ecosystem Management
- Environmental Chemistry
- Food Product Design and Packaging
- Food Product Development (30 pts)
- Food Safety Systems
- Geohazards & Risk
- Geospatial Analysis
- Health Protection
- Instrumental Analytical Chemistry
- Marine Ecology
- Modern Topics in Organic Chemistry
- Molecular Genetics
- Natural Compounds
- Natural Products
- Oceanography
- Organic Synthesis & Molecular Design
- Pacific Islands Coastal Ecology
- Pharmacology for Professional Practice
- Plant Ecology
- Protein and Metabolic Chemistry
- Remote Sensing
- Research Project (30 pts)
- Sedimentary Rocks & Processes
- Sensory Evaluation
- Socio-ecological Systems
- Structural Geology & Tectonics
- Surfaces, Colloids & Nanotechnology
- Volcanology



Ella Zhao
Quality Assurance Technologist, GS Hall & Company
Bachelor of Science in Food Science

"AUT is a modern and innovative university with strong connections with a wide range of industries and organisations. The academic staff always provide creative, interactive and specialised teaching with the latest technology. One of the things that stood out for me was that for much of our science classes, we did laboratory experiments in small groups. Everyone had a chance to get hands-on experience in carrying out the experiments and access the latest equipment. The large amount of lab work equipped us with solid practical skills and enabled us to stand out in the highly competitive field. Now, I constantly use what I learned to contribute towards providing high-quality products to our customers."

KEY FEATURES:

- Develop the skills to play a role in national or global conservation challenges
- Covers the biological and social science skills sought by employers
- Opportunity to complete a major research project in your final year

SEE YOURSELF AS:

- Working for conservation, in the field, in the office or both
- Interested in nature
- Objective, enquiring and open to new ideas

CAREER OPPORTUNITIES:

- Environmental consultant
- Science teacher[1]
- Conservation scientist for Department of Conservation, regional or city councils or Non-Government Organisations (NGOs) including Conservation International or WWF

Bachelor of Science
Applied Conservation

Want to help protect plants, animals and our natural environment? People who can advocate for change and improve the effectiveness of conservation initiatives are in demand in New Zealand and around the world. The Applied Conservation major addresses this need and was developed in partnership with the Department of Conservation.

You develop a mix of biological science and social science skills – a combination that is sought after by conservation employers like the Department of Conservation, council organisations and national and international NGOs. You'll graduate with the skills to work with communities and stakeholders to plan, manage and implement vital conservation projects.

What this major covers

Year 1

Papers you take this year include:

- Knowledge, Enquiry and Communication
- Health and Environment
- Plants and Animals
- Ecology and Evolution
- Biological Sampling and Interpretation
- Human Geography

You need to complete at least two papers from this group:

- Principles of Chemistry
- Biophysics
- Microbiology
- Biological Chemistry
- Biodiversity
- Our Dynamic Earth

These papers help you develop a general scientific grounding for a career in conservation, and prepare you for more advanced papers in Year 2 and 3.

Year 2 & 3

Papers include:

- Applied Conservation
- Biogeography
- Conservation Planning
- Ecosystem Management
- Environmental Law
- Geographic Information Systems
- Research Techniques
- Socio-ecological Systems

You need to complete two papers from this group:

- Fish and Aquatic Plants
- Freshwater Ecology
- Marine Invertebrates
- Plant and Animal Taxonomy
- Terrestrial Ecology

You also choose electives to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on a project related to your major.

Institutes and employer organisations involved include:

- Auckland Council
- Department of Conservation
- NIWA
- SCION (Rotorua)

Scholarships

We offer competitive scholarships for the first year of the Bachelor of Science, one for every major. AUT also offers a number of other scholarships, including the Vice-Chancellor's Scholarship, which many of our science students have received. For more information visit **aut.ac.nz/scholarships**

AUT encourages early application. Places are limited[2].

1. After completing a graduate diploma in education.
2. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

Ella Walmsley
Programme Coordinator, Whitebait Connection
Bachelor of Science in Environmental Sciences and Applied Conservation

"I had been interested in environmental education for a while now, and in this role I work with communities around streams in Auckland. This can involve working with a local school, going into the classroom, facilitating field trips and supporting action projects. I also work with community groups to educate locals.

"The variety of working with children, community groups and experts always keeps my role interesting and means I'm constantly learning and improving. I love getting to work with so many inspiring people. I also have the freedom to make my work my own by creating new activities.

"I wanted to study something that would increase my knowledge of our environment and give me the tools to improve it. I had heard that AUT was more practical, and that's an effective learning method for me. I also chose AUT because none of my friends were going to this university, and it would force me out of my comfort zone. I felt confident in doing this at AUT because it has a reputation for being friendly.

"The field trips that are part of the Bachelor of Science are what I enjoyed the most about my time at AUT. Going to the Central North Island including Pureora forest, to the Hunuas and to the Solomon Islands were all standout learning experiences and overall highlights."

KEY FEATURES:

- Biomedical science is a rapidly developing area
- Can open up numerous career opportunities
- Skills to advance human and animal health
- Access to AUT's specialist biomedical labs

SEE YOURSELF AS:

- Doing research in medical and health areas
- Interested in finding cures, preventing diseases and identifying health risks
- Creative, innovative and knowledgeable

CAREER OPPORTUNITIES:

- Research scientist in Crown Research Institutes, private research institutes and universities around the world
- Pharmaceutical and biotechnology companies
- Health product and food-for-health product companies
- Government organisations

Bachelor of Science
Biomedical Science

Biomedical science and biotechnology have revolutionised research over the past decade, stimulating growth in industries like agriculture, pharmaceuticals, veterinary science and medical research. Biomedical science is the most rapidly developing area in biological sciences, and demand for biomedical graduates is expected to grow.

If you're interested in emerging areas of medical and health science and how they can improve human and animal health, the Biomedical Science major could be right for you. You gain an understanding of fundamental physiology and biomedical research, working with the latest laboratory techniques and equipment. AUT has specialist biomedical labs with analytical equipment not available at any other New Zealand university.

What this major covers

Year 1

Papers you take this year include:

- Health & Environment
- Knowledge, Enquiry and Communication
- Principles of Chemistry
- Biological and Solution Chemistry
- Human Anatomy and Physiology I
- Microbiology
- Biological Sampling and Interpretation
- Plus one elective

These papers give you a scientific foundation in chemistry, biology and human physiology, and prepare you for more advanced papers in Year 2 and 3.

Year 2 & 3

You take the following papers:

- Analytical Chemistry
- Human Anatomy and Physiology II
- Biochemistry
- Methods of Research and Enquiry
- Cells, Genes and Molecules
- Pharmacology for Professional Practice
- Natural Compounds
- Biomedical Science
- Biomedical Technology

You also take elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Scholarships

We offer competitive scholarships for the first year of the Bachelor of Science, one for every major. AUT also offers a number of other scholarships, including the Vice-Chancellor's Scholarship, which many of our science students have received. For more information visit **aut.ac.nz/scholarships**

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For more details visit **aut.ac.nz/sciences**

Hannah Simon
3rd-year student, Bachelor of Science in Biomedical Science

"I've always been passionate about the sciences, particularly biology. I loved learning about human physiology and anatomy, and when I applied to AUT I wanted to find a path of study that had a similar focus but with a practical application. Biomedical science filled that role perfectly.

"In my final year I completed a year-long research project studying multidrug resistance in triple negative breast cancer cells. Cancer research was the most interesting subject we covered in the biomedical science core papers, and it was so rewarding to be able to put that knowledge to use, along with conducting my own lab work and self-guided research.

"Breast cancer research was something I'd always wanted to be involved in, and I was really grateful for the opportunity to conduct a self-guided study. I first wrote a literature review summarising current knowledge on ABC transporters and multidrug resistance, with background information of three current chemotherapeutic treatments. Then I carried out my own lab-based project to measure how the addition of myricetin affected intracellular doxorubicin concentration.

"I loved studying the Bachelor of Science at AUT. The work was challenging but rewarding, and it has given me a solid foundation knowledge to move into a career in human biological sciences. I also enjoyed that lab work was a large part of the contact time with the lecturers."

KEY FEATURES:

- Develop skills relevant to a wide range of industries
- Progressive environmental and food chemistry knowledge
- Opportunity to complete a research project and industry placement

SEE YOURSELF AS:

- Accurate and objective
- Enquiring and observant
- Analytical and creative
- Organised with an eye for detail

CAREER OPPORTUNITIES:

- Chemist
- Analytical, environmental, paint or research chemist
- Pollution control consultant
- Research scientist
- Local councils: Environmental, public health, and waste management and monitoring services
- Science teacher[1]

Bachelor of Science
Chemistry

Developing new products and processes, and experimenting with the make-up and behaviour of different chemicals are some of the challenges chemistry graduates get to take on. A degree in chemistry opens the door to a wide range of career options, both in and out of the laboratory. Study with us and you're exposed to a wide range of areas in chemistry including environmental, biological, organic, physical, inorganic, food and analytical chemistry. You gain essential practical laboratory skills needed to be successful in scientific employment – here and overseas.

Chemistry graduates are often employed in the chemical and related industries, including pharmaceuticals, agrochemicals, petrochemicals, toiletries, plastics and polymers. There are also opportunities in the food and drink industry, health and medical organisations, and scientific research organisations and agencies.

What this major covers

Year 1

Papers you take this year include:

- Knowledge, Enquiry and Communication
- Health and Environment
- Principles of Chemistry
- Biological and Solution Chemistry
- Biophysics
- Plus three electives

These papers give you a general scientific grounding and prepare you for more advanced papers in Year 2 and 3.

Year 2 & 3

You need to complete four papers from this group:

- Analytical Chemistry
- Physical Chemistry
- Biochemistry
- Inorganic Chemistry
- Organic Chemistry

You need to complete three papers from this group:

- Advanced Analytical Chemistry
- Advanced Inorganic Chemistry
- Surfaces, Colloids and Nanotechnology
- Organic Synthesis and Molecular Design
- Protein and Metabolic Chemistry

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This will involve two semesters of work in the chemistry postgraduate laboratory where you carry out research into making new compounds, developing new methods to analyse compounds, determining the chemical reactivity of compounds or studying how chemical reactions occur.

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Emma Matthewman
3rd-year student, Bachelor of Science in Chemistry

"In the 2017/2018 summer break, I completed a summer research project with AUT lecturer Dr Cameron Weber. This research project focused on ionic liquids, low melting salts with the potential to replace harmful molecular solvents, and the effect of their structure on the reactivity of organic molecules.

"Completing this research also led to the opportunity to perform experiments at the Australian Synchrotron, a world-class research facility in Melbourne, earlier this year. Both of these experiences have allowed me to gain insight into the world of chemistry research, and have equipped me with the skills to be successful in my future study and career.

"I've always had a keen interest in science and its ability to explain the world around us. Chemistry was a subject I particularly enjoyed at high school, and I wanted to continue to learn more about this area. I have friends and family who attended AUT, and they thoroughly enjoyed their experience and praised AUT for its modern, hands-on approach to education and its deep sense of community.

"I've genuinely enjoyed learning more about chemistry, including discovering what aspects of this discipline I'm most passionate about and furthering my knowledge of the potential career paths within this industry. The practical laboratory experience I've gained and the research opportunities I've had at AUT are second to none, and will stand me in good stead for my future."

KEY FEATURES:

- Pathway to rewarding environmental careers
- Hands-on learning in the natural environment
- Opportunity to complete a research project and industry placement

SEE YOURSELF AS:

- Motivated
- Adaptable and creative
- Practical and disciplined
- Interested in the natural environment

CAREER OPPORTUNITIES:

- Conservation organisations like the Department of Conservation
- Environmental consultant
- Government research and monitoring agencies
- Local councils: Environmental, public health, and waste management and monitoring services
- Science teacher[1]
- Scientific laboratory analyst

Bachelor of Science
Environmental Sciences

New Zealand's spectacular natural environment is the envy of the world. Throughout the Environmental Sciences major you can immerse yourself in this environment through the field trips that are an essential part of this major.

By studying environmental sciences you explore how species interact with each other and with their physical environment. You also explore the ecological principles of freshwater and terrestrial ecosystems, animal behaviour and ecology, and plant ecology. This understanding is essential to protect New Zealand's unique natural environment, and is an essential foundation for many rewarding environmental sciences careers.

What this major covers

Year 1

Papers you take this year include:

- Knowledge, Enquiry and Communication
- Health and Environment
- Plants and Animals
- Ecology and Evolution
- Biological Sampling and Interpretation

You must take three papers from this group:

- Principles of Chemistry
- Biological Chemistry
- Microbiology
- Biophysics
- Our Dynamic Earth
- Biodiversity
- Human Geography

These papers give you a general scientific grounding and prepare you for more advanced papers in Year 2 and 3.

Year 2 & 3

Papers include:

- Environmental Risk Assessment
- Terrestrial Ecology
- Environmental Law
- Freshwater Ecology
- Research Techniques
- Plant Ecology
- Ecosystem Management
- Animal Behaviour and Ecology

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Companies or research organisations involved include:

- Auckland Council
- Department of Conservation
- SCION (Rotorua)

Scholarships

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Lorenzo Fiori

Doctor of Philosophy candidate

"My research looks at cetacean interactions with tourism activities, as well as the use of small unmanned aerial vehicles (UAVs) as a tool for cetacean research.

"I'm specifically looking at the behaviour of humpback whales during vessel approach and in-water human interactions in Vava'u in the Kingdom of Tonga. This study will provide baseline data for conservation government agencies, and important guidelines for tour operators involved in whale-watching tourism.

"For my PhD research, I'm collaborating with Tongan whale-watching tour operators. I'm also involved in the investigation of behavioural responses of dolphins to small UAVs. It's important to learn more about how cetaceans interact with human tourism activities. I love this research, and I'm dedicated to becoming an expert in this field.

"I've conducted several UAV operations for AUT, including the aerial video of Bryde's whales feeding. Our aerial video of Bryde's whales feeding near Great Barrier Island was a big achievement in terms of showcasing to the general public how UAVs can represent a revolutionary tool for cetacean behavioural studies. I've tested this technology in New Zealand and overseas, and I'm fascinated by its potential for different spatial ecology applications."

KEY FEATURES:

- Global demand for food safety graduates
- Critical food chemistry and microbiology skills
- Opportunity to complete a research project and lab placement

SEE YOURSELF AS:

- Analytical, independent and critical
- Knowledgeable about microbiological, chemical, and physical hazards in foods and food processing
- Organised and attentive to detail

CAREER OPPORTUNITIES:

- Food safety inspector
- Food microbiologist
- Food service executive
- Risk communication specialist
- Food safety programme executive
- Quality assurance officer
- Quality control executive

Bachelor of Science
Food Safety

Food and beverage exports are critical to New Zealand's economy but overseas markets want to make sure that these products are safe and of high quality. New Zealand organisations need to meet the necessary food safety standards to avoid being blocked from important markets. An understanding of food safety is also essential to minimise the economic impact of crop damage and food spoilage.

This major addresses this need for food safety graduates. You gain important practical skills in food microbiology, instrumental food analysis and food chemistry. These skills are highly transferable, and can lead to exciting careers around the world.

What this major covers

Year 1

Papers you take this year include:

- Knowledge, Enquiry and Communication
- Health and Environment
- Principles of Chemistry
- Food Science
- Biological and Solution Chemistry
- Microbiology
- Biological Sampling and Interpretation
- Plus one elective

These papers give you a general scientific grounding and prepare you for more advanced papers in Year 2 and 3.

Year 2 & 3

Papers include:

- Environmental Risk Assessment
- Analytical Chemistry
- Food Microbiology
- Communicable Diseases
- Research Techniques
- Food Industry Legislation
- Health Protection
- Advanced Food Microbiology
- Food Safety Systems

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Companies or research organisations involved include:

- AWS Group
- Food Safe Ltd

Scholarships

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For more details visit **aut.ac.nz/sciences**

Saipriya Shahi
Quality Assurance Coordinator, Pernod Ricard Winemakers
Bachelor of Science in Food Science

"I love that I can use my understanding of food science to make a difference. Pernod Ricard Winemakers has over 18,500 employees in 80 countries, and we're one big family working to make a positive impact. It's such meaningful work because we not only get to be a part of the process that aims to create the best products but we also get to make a positive difference for the environment.

"Through this role I can help to create a better future for consumers by providing them with innovative yet quality products, and making sure the products that go out into the consumer market are safe and compliant with the regulations.

"I just loved the overall experience of studying at AUT. The academic staff were extremely supportive. They genuinely wanted their students to not only learn but to do the best they possibly could.

"I had the opportunity to be part of many different events, which truly encouraged me to step out of my comfort zone. But the best part about studying at AUT has to be the practical experience you gain as part of your degree. It really prepares you to step out into the real world straight after graduation, and it also helps you recognise how well you've understood the content."

KEY FEATURES:

- A wide range of careers within the food sector
- Focuses on the science behind the food we eat
- Opportunity to complete a food product development project

SEE YOURSELF AS:

- Knowledgeable about a range of sciences and their applications to food
- Meticulous particularly with regards to health, safety and hygiene
- A creative problem-solver

CAREER OPPORTUNITIES:

- Product development scientist
- Food microbiologist
- Sensory scientist
- Food chemist
- Food scientist

Bachelor of Science
Food Science

Food innovation is driven by trends like reducing sugar, sodium and fat; using more natural flavourings and colourings, and improving the shelf-life of foods. Food scientists are critical in the production of food. Food science opens the door to a range of careers – developing new food products, improving sensory attributes and nutritional content of foods, and finding new ways to preserve, process, package and distribute food.

The Food Science major introduces you to the science behind the food we eat. You become familiar with food chemistry, food microbiology, sensory science, food product development and food processing and technology. It covers the science and practical skills involved in the production, preservation, safety and quality evaluation of foods. You learn to analyse the characteristics of food, discover new food sources, and research how to make processed foods safe and healthy.

What this major covers

Year 1

Papers you take this year:

- Knowledge, Enquiry and Communication
- Health and Environment
- Principles of Chemistry
- Food Science
- Biological and Solution Chemistry
- Biophysics
- Microbiology
- Biological Sampling and Interpretation

These papers give you a general scientific grounding and prepare you for more advanced papers in Year 2 and 3.

Year 2

Papers you take this year:

- Analytical Chemistry
- Food Microbiology
- Food Process Engineering
- Food Technology
- Food Chemistry

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Year 3

Papers you take this year:

- Advanced Food Microbiology
- Advanced Food Chemistry
- Sensory Evaluation
- Food Product Development OR Research Project

You also choose elective papers[1].

Workplace experience

In your final year you can enrol in either the Food Product Development or the Research Project paper if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Companies or research organisations involved include:

- AgResearch
- Future Cuisine Ltd
- Goodman Fielder
- McCowley Enterprises Ltd
- Merit Meats Ltd
- Olivado NZ
- Tegel
- Thoughtgroup Ltd

Scholarships

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AUT encourages early application. Places are limited[2].

1. If you take the Food Product Development paper you also need to complete four electives. If you choose the Research Project you need to complete three electives.
2. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

Rahul Kaushik Permal
Doctor of Philosophy candidate
Bachelor of Science (Honours)
Bachelor of Science in Food Science

"AUT provides one of the most supportive and encouraging environments for postgraduate study, and we have a vast range of equipment and facilities to use and access. The academic staff and technicians are all experts in their field and provide excellent guidance, going out of their way to help any student who needs assistance.

"When I first came to AUT I realised that my main problem was that I wouldn't approach people for help; something that AUT encourages every student to do. The lecturers at AUT always state that 'no question is a silly question'. I took this very seriously and approached lecturers every opportunity I could. I can say with 100% certainty that if I hadn't come to AUT I would never have regained my confidence or pursued my love for science.

"I enjoyed my Bachelor of Science and Bachelor of Science (Honours) so much that I ultimately decided to continue further and extend my research by enrolling in the Doctor of Philosophy offered at AUT.

"My PhD research is focused on converting by-products of cold pressed avocado oil – mainly seeds, skin, pulp and waste water – into functional ingredients. This research could make a difference in the food industry, as demand for avocado oil has drastically increased over the past few years."

KEY FEATURES:

- High demand for geoscience graduates
- Skills to plan for geophysical processes
- Opportunity to complete a major research project in your final year

SEE YOURSELF AS:

- Having creative problem-solving skills
- Interested in the natural environment, sustainability and geohazards
- Curious about how the Earth has evolved

CAREER OPPORTUNITIES:

Geoscience can open doors in a range of careers including resource companies, government, national and international development, pollution and waste, environmental consultancies, museums and national parks.

Careers this major can lead to include:

- Geological scientist for government departments, regional or city councils or non-government organisations (NGOs) like Greenpeace, Oxfam, WaterAid, Land Information NZ, Department of Conservation, Department of Primary Industries, Ministry of Foreign Affairs and Trade, Ministry for the Environment and Ministry of Business Innovation and Employment
- Private consultancies for environment, construction, infrastructure, resources and geohazards
- Research scientist for NIWA, Land Information NZ, World Bank, green technology industries, and mining, oil and gas industries
- Science teacher[1]

Bachelor of Science
Geoscience

Want to understand how our Earth works as a whole planet? Study the Geoscience major in the Bachelor of Science and learn more about our planet and your world. Explore how Earth compares to other planets, why we experience earthquakes, where the new resources of tomorrow will come from, and how you fit into 4.6 billion years of time.

Our Geoscience major emphasises aspects of geology, including geo-hazards and risk, geological applications to the environment, geological field skills, and rocks, minerals and the processes that produce earth materials. It focuses on the Earth as a planet and how it has evolved through time. Different papers examine how the Earth formed, the early Earth, how continents were created and evolved, how life became an integral part of Earth systems and links between mountains, oceans, volcanoes, earthquakes and mineral deposits.

A Geoscience major in conjunction with AUT's Geospatial Science, Environmental Sciences, Applied Conservation or Marine Biology majors will produce strong degree combinations.

What this major covers

Year 1

Complete the following papers:

- Knowledge, Enquiry and Communication
- Health and Environment or Hauora Māori and Environment
- Principles of Chemistry
- Ecology and Evolution
- Biological Sampling and Interpretation
- Our Dynamic Earth

And at least two of:

- Introductory Astronomy
- Biological and Solution Chemistry
- Biophysics
- Biodiversity
- Human Geography
- Microbiology
- Plants and Animals

Year 2 & 3

Papers include:

- Research Techniques
- Geographic Information Systems
- Geology, Landscape and Environment
- Sedimentary Rocks and Environments
- Environmental Risk Assessment

You must complete at least three papers from this group:

- Oceanography
- Remote Sensing
- Structural Geology and Tectonics
- Earth Materials
- Volcanology
- Geohazards and Risk

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Institutes and employer organisations involved include:

- Auckland Council
- Department of Conservation
- SCION (Rotorua)
- GNS Science
- NIWA
- Land Information NZ
- Department of Primary Industries
- Ministry of Foreign Affairs and Trade
- Ministry for the Environment
- Ministry of Business Innovation and Employment
- Private consultancies for environment, construction, infrastructure and resources
- Disaster and risk agencies in NZ and internationally
- WaterAid
- Greenpeace
- Oxfam
- World Bank
- UN and regional development environmental scientific and cultural agencies
- Mining, and oil and gas industries
- Green technology industries
- National and regional park agencies

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Hinengarangi Makoare
Niuean, Ngāti Whātua, Te Rarawa
3rd-year student, Bachelor of Science in Applied Conservation and Geospatial Science

"Coming from Niuean and Māori backgrounds, I grew up with a understanding of the environment and its importance, value and sacredness. In high school I began to understand the importance of people, connection and your whakapapa; where you come from. It was then that I decided I wanted a job that incorporated this with work in the environment.

"I decided to study at AUT because the environmental sciences papers aligned with the path I wanted to take towards my career choice. My dream is to work alongside my people to further protect and preserve our land, sea, resources and traditions. I would love to work either here in Aotearoa or in the Pacific.

"One of the papers I particularly enjoyed was the geoscience paper Geology, Landscape and Environment, taught by Professor Michael Petterson. What I enjoyed most was that this paper made you forget you're in a classroom. The assessments didn't feel like work to meet a deadline but were more about deepening your understanding of the world, which is what education should feel like.

"I believe a good teacher provides the information and resources but allows you to think critically and decide where to build from there. The staff that I've encountered at AUT do just that."

KEY FEATURES:

- High demand for geospatial science graduates
- Skills to inform conservation and shape the physical spaces people live in
- Research project and industry placement options

SEE YOURSELF AS:

- Having creative problem-solving skills
- Interested in the natural environment, sustainability and geospatial planning
- Curious about using maps and GIS software

CAREER OPPORTUNITIES:

- Environmental planner
- GIS analyst or consultant
- Natural resource or hazard manager
- Sustainable development planner
- Geography teacher[1]
- Geospatial scientist for Crown-owned Research Institutes, government departments and local government

Bachelor of Science
Geospatial Science

The work of a geospatial scientist shapes the spaces we live in. Geospatial scientists help determine where schools, hospitals and new housing areas are located, and how to make the most efficient use of available resources. Geospatial scientists also identify which areas need environmental protection. Geospatial science at AUT emphasises its use for conservation planning. Graduates with geospatial science skills are sought after by a range of employers, and demand will continue to grow, spurred on by population growth and finite resources.

In the Geospatial Science major you learn to interpret, analyse, present, and distribute information about locations in space and time. You explore an awareness of environmental considerations, and develop geospatial plans for environmental management and resource planning.

What this major covers

Year 1

Papers you take this year include:

- Knowledge, Enquiry and Communication
- Health and Environment
- Plants and Animals
- Ecology and Evolution
- Biological Sampling and Interpretation
- Our Dynamic Earth or Human Geography

You must complete at least two papers from this group:

- Principles of Chemistry
- Biophysics
- Microbiology
- Biological and Solution Chemistry
- Biodiversity

Year 2 & 3

Papers include:

- Environmental Law
- Research Techniques
- Geographic Information Systems
- Biogeography
- Planning for Environmental Sustainability
- Geospatial Analysis
- Remote Sensing
- Ecosystem Management

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers please refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Scholarships

We offer competitive scholarships for the first year of the Bachelor of Science, one for every major. AUT also offers a number of other scholarships, including the Vice-Chancellor's Scholarship, which many of our science students have received. For more information visit **aut.ac.nz/scholarships**

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For more details visit **aut.ac.nz/sciences**

Milimo Muleya
Zambia
Master of Science (Research) student

"I'm researching how photogrammetry can be used for conducting a risk assessment of a landfill site. My research was motivated by looking around at the various amounts of waste we produce and send to landfill sites. In Zambia, solid waste management is a problem for many communities and that inspired my research. My research will help communities and industry understand the risks associated with unregulated disposal sites and highlight the need for sustainable waste management practices.

"My biggest challenge was turning the vision for my research into reality, as I wasn't sure what technology I could use to critically analyse an entire landfill. AUT helped me by connecting me to the right supervisors whose combined expertise enables me to work on a research project I'm passionate about.

"AUT has afforded me the opportunity to learn from highly experienced and knowledgeable educators and friendly staff. I've been able to study how to apply technology to science, especially in my area of focus, environmental science.

"Science and technology have always combined to create better scientists and AUT combines both to produce the best in the field. AUT offers a wide range of programmes for students with varying interests, and has the expertise and facilities to ensure students have a full understanding of what they choose to study."

KEY FEATURES:

- Skills to keep people safe in their daily lives
- Graduates are in high demand by employers
- Opportunity to complete a research project and industry placement

SEE YOURSELF AS:

- Motivated, adaptable and persuasive
- Able to relate well to people from various groups
- Interested in health from a community and environmental perspective

CAREER OPPORTUNITIES:

- Inspecting food premises, tattooists, hairdressers, beauty salons or camping grounds
- Noise control and environmental noise
- Air quality, drinking water quality and beach water quality
- Communicable disease investigation
- Vector control
- Investigating public health nuisances
- Biosecurity[2]
- Ministry for Primary Industries[2]

Bachelor of Science
Health Protection

Interested in protecting people and communities from pollution, unsafe food, infectious diseases and poor living conditions? Health protection is a growing industry and health protection and environmental health officers are in high demand throughout New Zealand – our students often secure employment before they graduate. This major is a great stepping stone to a career as an environmental health officer or health protection officer[1].

The Health Protection major explores environmental health, pollution control, food safety, environmental and public health law, risk assessment, toxicology and communicable disease control. You'll be equipped to keep people safe in their homes, offices and natural environment.

What this major covers

Year 1

Papers you take this year include seven compulsory papers:

- Knowledge, Enquiry and Communication
- Health and Environment
- Principles of Chemistry
- Plants and Animals
- Microbiology
- Biological Sampling and Interpretation
- Epidemiology

You must complete at least one paper from this group:

- Biological and Solution Chemistry
- Ecology and Evolution
- Biophysics
- Food Science
- Biodiversity
- Human Geography

Year 2 & 3

You take a mix of level 6 and 7 papers, including:

- Environmental Risk Assessment
- Food Microbiology
- Environmental Health
- Environmental Microbiology
- Geographic Information Systems
- Communicable Diseases
- Geospatial Analysis
- Advanced Food Microbiology
- Health Protection

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers please refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Scholarships

We offer competitive scholarships for the first year of the Bachelor of Science, one for every major. AUT also offers a number of other scholarships, including the Vice-Chancellor's Scholarship, which many of our science students have received. For more information visit **aut.ac.nz/scholarships**

AUT encourages early application. Places are limited [3].

1. Environmental health officers (EHOs) work for city or district councils while health protection officers (HPOs) work for district health boards.
2. After gaining experience there is the opportunity to work in biosecurity or the Ministry for Primary Industries.
3. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

Tara Rahdar
Health Protection Officer, Community and Public Health, Canterbury District Health Board
Bachelor of Science in Health Protection and Environmental Health

"I chose AUT because of positive feedback from my friends and because I was looking for smaller, more interactive classes. I think you learn twice as much in a more interactive environment where you can exchange ideas. I love being able to make a difference through my work. Health protection officers plan and implement activities that protect people's health and wellbeing in areas that range from biosecurity and quarantine, to drinking water quality, hazardous substances and resource management issues. I've been involved in biosecurity, investigating the spread of disease, and risk assessment and management. This has included investigating a case of Legionnaires' disease, mosquito biosecurity work and addressing public health concerns. I absolutely love my job."

Employer comment

"Skilled and qualified health protection officers are the 'engine room' for public health units' health protection work, which encompasses health education as well as legislative enforcement activities. We were looking for someone with sound communication, technical and investigatory skills, combined with good time management and the ability to fit within the team. Tara was a qualified health protection officer and had all the qualities we were looking for."

Paul Schoolderman; Team Leader, Health Protection, Communicable Disease; Canterbury District Health Board

KEY FEATURES:

- Dynamic industry with regular new discoveries
- Hands-on learning in marine environments, using AUT's custom-built boat
- Opportunity to complete a research project and industry placement

SEE YOURSELF AS:

- Enquiring, observant and patient
- Motivated and persistent
- Someone who enjoys the outdoors
- Passionate about the ocean and the life within it

CAREER OPPORTUNITIES:

- Aquaculture business owner
- Marine scientist or technologist
- Farm/hatchery manager
- Production supervisor
- Science teacher[1]

Bachelor of Science
Marine Biology

With 71 percent of the Earth's surface covered by water, marine life is critical to our existence. It's one of the most valuable sources of food, medicine and raw materials. New discoveries are made daily in marine biology and ecology, making this an exciting and dynamic career choice with endless potential.

This major covers marine biology (the scientific study of organisms in the ocean) and marine ecology (how marine organisms interact with each other and the environment). You become familiar with a range of marine sciences, including the biology of fish and aquatic plants and marine invertebrates. Field trips are a key part of this major – you frequently go out on boats to investigate marine life or learn about aquaculture techniques, coastal processes, oceanography, management and conservation theories and practices.

What this major covers

Year 1

Papers you take this year include:

- Knowledge, Enquiry and Communication
- Health and Environment
- Plants and Animals
- Ecology and Evolution
- Biological Sampling and Interpretation

You must complete at least three papers from this group:

- Biodiversity
- Our Dynamic Earth
- Principles of Chemistry
- Biophysics
- Microbiology
- Biological and Solution Chemistry
- Human Geography

Year 2 & 3

Papers include:

- Fish and Aquatic Plants
- Marine Invertebrates
- Research Techniques
- Environmental Law
- Marine Ecology
- Ecological Management and Modelling
- Oceanography

You also choose electives to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Companies or research organisations involved include:

- NIWA
- New Zealand Premium Whitebait
- OceaNZ Blue

Scholarships

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For more details visit **aut.ac.nz/sciences**

Dannie Cullen
Graduate Environmental Scientist, AECOM
Bachelor of Science (Honours)
Bachelor of Science in Marine Biology and Environmental Sciences

"I became a junior open water diver when I was ten, and my intended career path has always been connected to the environment in some way. A degree in marine biology felt like a natural choice for me. I was attracted to AUT's Bachelor of Science as it offered me an opportunity to do a double major. The opportunity to study both marine biology and environmental sciences was a no-brainer for me.

"Throughout my time at AUT, I was offered a number of different learning experiences including fish and aquatic plant identification while snorkelling at the Goat Island Marine Reserve, terrestrial vegetation identification in the Pureora Forest Park, improving my technical skills in the laboratory and learning to conduct a scientific study, collect and analyse data and report effectively.

"Having a wide range of different experiences at AUT gave me the ability to adapt to different challenges; something that has been extremely useful in my career now.

"I love being able to work both outdoors and in the office. I really enjoyed doing fieldwork for my Bachelor of Science (Honours) dissertation at AUT, and this is no different at the workplace. I'm often working out in the field, conducting groundwater investigations and environmental soil sampling. I also spend time processing data and reporting."

KEY FEATURES:

- Transferable skills for multiple industries
- Diverse career options in human health, food, agriculture and biotech
- Opportunities for research projects and industry placements

SEE YOURSELF AS:

- Persistent, enquiring and innovative
- Analytical, accurate, careful and patient
- Able to communicate complex ideas simply
- Interested in biology

CAREER OPPORTUNITIES:

- Environmental microbiologist
- Food quality assurance scientist
- Food microbiologist
- Scientific laboratory technician
- Research scientist
- Technical brewer
- Science teacher[1]

Bachelor of Science
Microbiology

Interested in how microorganisms interact with the environment? Want to know how to detect the microorganisms that cause diseases and spoilage? Want to be involved with industries that produce antibiotics, foods and drinks, or alternative fuels? Microbiology is the study of living organisms and infectious agents that can't be seen by the naked eye.

The Microbiology major prepares you for careers in this interesting and dynamic field. You explore the role of microorganisms across many areas – human health, industry, agriculture and the environment. You develop the skills for careers in a wide variety of settings in industry, research or government organisations.

What this major covers

Year 1

Papers you take this year include:

- Knowledge, Enquiry and Communication
- Health and Environment
- Microbiology
- Biological and Solution Chemistry
- Ecology and Evolution
- Principles of Chemistry

You must complete at least two papers from this group:

- Biological Sampling and Interpretation
- Human Geography
- Plants and Animals
- Biodiversity
- Food Science
- Biophysics

Year 2 & 3

Papers include:

- Environmental Microbiology
- Food Microbiology
- Biochemistry
- Industrial Microbiology
- Cells, Genes and Molecules
- Principles of Genetics
- Advanced Food Microbiology
- Biotechnology
- Molecular Genetics

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Companies or research organisations involved include:

- Drapac Co. (NZ)
- OceaNZ Blue
- Sanitas NZ

Scholarships

We offer competitive scholarships for the first year of the Bachelor of Science, one for every major. AUT also offers a number of other scholarships, including the Vice-Chancellor's Scholarship, which many of our science students have received. For more information visit **aut.ac.nz/scholarships**

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Lee Rabbidge

Scientist (Virology), Plant Health and Environment Laboratory, Ministry for Primary Industries
Master of Science (Research)
Bachelor of Science in Microbiology

"I decided at the age of 25 that I wanted to change careers. I had always been interested in the sciences and was inspired by friends working in scientific fields. Microbiology and genetics had always interested me and AUT offered a degree that covered both - which intrigued me. After further investigation into the university, and hearing friends comment on the interactive learning at AUT, I decided to take the plunge.

"AUT's science programmes focus on teaching contemporary and next-generation knowledge. The inclusive, social and exciting environment at AUT also helps with achieving your academic goals.

"The friends and connections I made along the way were definitely one of the highlights for me. Sharing the struggle of exams or helping to get that assignment in on time with good marks was stressful at the time, but looking back it truly was the best of times. We still all meet up and chat often.

"I now work at the Ministry for Primary Industries, providing molecular diagnostic services for exotic and emerging pests and diseases affecting plants and the environment. What I love most about this career is learning new things every day, working with an expert, talented and friendly team, and knowing that my work is contributing to the biosecurity of New Zealand's primary industries."

Bachelor of Science
Molecular Genetics

Ever wondered why humans are so similar yet so different? Study molecular genetics at AUT to be part of the biotechnology revolution, and help develop new medicines and make agriculture more sustainable. Learn about the basic molecules of life and how they work, how we study them, and how they're being used to understand our world and to ensure our future health and environment.

Molecular genetics can open doors to a range of careers including medicine and drug development, research, agriculture, conservation management, policy development, product development, food science, microbiology and forensics.

This major is designed to stand alone as a Bachelor of Science in Molecular Genetics but also enables students to select it as part of a double major and complete a qualification specific to their areas of interest.

What this major covers

Year 1

Complete the following papers:

- Biological Sampling and Interpretation
- Principles of Chemistry
- Biological and Solution Chemistry
- Knowledge, Enquiry and Communication
- Health and Environment or Hauora Māori and Environment
- Microbiology

And at least two of:

- Plants and Animals
- Ecology and Evolution
- Biodiversity
- Our Dynamic Earth
- Human Geography
- Biophysics

Year 2 & 3

Papers include:

- Biochemistry
- Principles of Genetics
- Cells, Genes and Molecules
- Research Techniques

You must complete at least three papers from this group:

- Protein and Metabolic Biochemistry
- Molecular Genetics
- Molecular Diagnostics
- Computational Genetics
- Microbial Genetics

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

KEY FEATURES:

- High demand for molecular geneticists
- Skills to work with meta data
- Opportunity to complete a major research project in your final year

SEE YOURSELF AS:

- Having creative problem-solving skills
- Interested in the genetic basis of life
- Curious about how genetic data can be used in medicine, conservation and agriculture

CAREER OPPORTUNITIES:

Research scientist for government and private research institutes, or Non-Government Organisations (NGOs) including:

- Plant and Food Research
- Manaaki Whenua Landcare Research
- AgResearch
- Institute of Environmental Science and Research (ESR)
- SCION (Rotorua)

Scientist working for government departments and ministries or regional or city councils, including:

- Ministry of Business, Innovation and Employment
- Auckland Council
- Environmental Protection Authority
- Ministry for Primary Industries
- Department of Conservation

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Institutes and employer organisations involved include:

- Plant and Food Research
- Manaaki Whenua Landcare Research
- AgResearch
- Institute of Environmental Science and Research (ESR)
- SCION (Rotorua)
- Ministry of Business, Innovation and Employment
- Environmental Protection Authority
- Ministry for Primary Industries

Scholarships

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For more details visit **aut.ac.nz/sciences**

KEY FEATURES:

- Useful skills in a large range of industries
- Skills in testing behavioural theory
- Opportunity to complete a major research project in your final year

SEE YOURSELF AS:

- Having creative problem-solving skills
- Interested in how people think
- Curious about what motivates human behaviour

CAREER OPPORTUNITIES:

Research scientist for private companies, and local and central government, including:

- Airways
- Auckland Council
- Corrections Department New Zealand
- Defence Technology Agency
- Department of Conservation
- Employment Relations Authority
- Ministry of Transport
- New Zealand Transport Agency
- WorkSafe

Bachelor of Science
Psychology

Want to understand people, and how they behave and think? The Psychology major in the Bachelor of Science prepares you for a career as a research scientist. You'll gain a better understanding of how people behave and think, which is a substantial advantage in today's workplaces, regardless of your career.

Modern psychology is theoretical and experimental in nature, and current knowledge is based on observable and repeatable behavioural data. This can include counts of behaviours in animals and humans, and verbal accounts about emotions. That's why the Psychology major includes practical work in laboratories or the field.

What this major covers

Year 1

Complete the following papers:

- Knowledge, Enquiry and Communication
- Health and Environment or Hauora Māori and Environment
- Biological Sampling and Interpretation
- Introduction to Psychology B
- Introduction to Psychology A

And at least two of:

- Plants and Animals
- Principles of Chemistry
- Biological and Solution Chemistry
- Ecology and Evolution
- Biodiversity
- Our Dynamic Earth
- Human Geography
- Human Anatomy and Physiology I
- Plus one elective

Year 2 & 3

You need to complete:

- Research Techniques

You must complete three papers from this group:

- Individuals and Identities
- Psychological Assessment
- Brain and Behaviour
- Cognitive Psychology
- Abnormal Psychology
- Social Psychology
- Personality

You must also complete three papers from this group:

- Emotions and Human Nature
- Experimental and Applied Behaviour Analysis
- Critical Evaluation in Psychology
- Biopsychology
- Positive Psychology
- Applied Issues in Cultural and Social Psychology
- Experimental and Applied Behaviour Analysis II
- Health Psychology
- Approaches to Psychological Intervention
- Advanced Research Methods in Psychology

You also choose elective papers to make up the 360 points required for your degree. For a list of elective papers refer to page 13.

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have at least a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Institutes and employer organisations involved include:

- Airways
- Auckland Council
- Defence Technology Agency
- Department of Conservation
- Employment Relations Authority
- Ministry of Transport
- New Zealand Transport Agency
- WorkSafe

Scholarships

We offer competitive scholarships for the first year of the Bachelor of Science, one for every major. AUT also offers a number of other scholarships, including the Vice-Chancellor's Scholarship, which many of our science students have received. For more information visit **aut.ac.nz/scholarships**

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Bachelor of Advanced Science (Honours) [BAdvSc(Hons) | AK2040] Overview

QUICK FACTS

Level:	8
Points:	480
Duration:	4 years F/T, equivalent P/T
Campus:	City
Starts:	22 Feb 2021

Claire Ellis
Bachelor of Advanced Science (Honours) student

"I chose to study at AUT after I went to a science talk at my high school where two lecturers spoke about AUT's intention to equip students with a lot of practical knowledge. I've enjoyed the analytical side of science; the experiment design and analysis of data. The highlight of my time at AUT, however, was spending two weeks in the Solomon Islands on a field trip. It was an incredible experience, made even better by the people who were on it. My career goal is to be a researcher, finding new patterns in our environment and working towards a more sustainable future. The Bachelor of Advanced Science (Honours) is the best route to achieve this goal because as part this degree you conduct your own research. My honours research this year focuses on the succession of two Auckland regional parks over a 10-year period, before pest proof fencing was added."

The new four-year (480 points) Bachelor of Advanced Science (Honours) is a response to the needs of high-performing students. It provides direct entry for selected students from high school into a postgraduate degree.

In the Bachelor of Advanced Science (Honours), you can study some second-year papers in your first year, some third-year papers in your second year and some postgraduate papers in your third year. The fourth year consists of postgraduate papers and a one-semester research project. High-performing students will be eligible for direct entry into a PhD.

Entry requirements

Minimum entry requirements

- Applicants must have completed one or more years in a Bachelor of Science with a B+ grade average; OR
- Achieved NCEA level 3 with at least 260 points (or 310 in CIE, or 33 in IB) in university approved subjects and at least 16 NCEA credits each in two subjects from: Biology, Chemistry, Earth and Space Science, Physics, Science, Calculus, Mathematics and Statistics.

Specialisations

- Applied Conservation
- Biomedical Science
- Chemistry
- Environmental Science
- Food Science
- Geospatial Science
- Microbiology
- Molecular Genetics

Applied Conservation

This specialisation focuses on identifying and solving conservation problems by working with communities. Papers cover socio-ecological systems and conservation planning, biology and ecology, as well as geographical information systems, which is proving to be an essential tool for conservation planning.

Biomedical Science

Develop the range of skills you'll need if you want to move into biomedical research in New Zealand and internationally. This specialisation is designed to reflect the current needs of the pharmaceutical/nutraceutical industry.

Chemistry

Papers in this specialisation cover the range of skills you'll need if you want to continue into chemistry research or start a career in industry either in New Zealand or around the world.

Environmental Science

Environmental science is a strong research area within AUT's School of Science. This specialisation includes papers in a broad range of areas, including marine biology, terrestrial ecology, plant physiology and animal behaviour.

Food Science

Food science is particularly relevant for New Zealand, as food products make up the bulk value of our exports. AUT's School of Science has strong links to industries that provide students with research opportunities in the fields of food microbiology, food chemistry and sensory evaluation.

Geospatial Science

Geospatial science is another strong research area within the School of Science. We have pioneered high-resolution 3D mapping for conservation purposes using drones in Antarctica, Australia, Africa and New Zealand. Currently, we're developing a major partnership with NASA in the USA.

Microbiology

Papers in this specialisation cover molecular microbiology, environmental microbiology, food microbiology, microbial biotechnology and viral plant pathology. Microbiology is another area of strength for us, and we have a number of international collaborations in this field.

Molecular Genetics

This field of research has seen major technological advancements in recent years and offers ever-increasing career opportunities. Molecular genetics is a strong research area at AUT, and our students have access to state-of-the-art equipment.

What this qualification covers

You complete 480 points including the postgraduate research project (60 points) in which you gain skills in scientific research and in drafting a paper in a format suitable for a scientific journal publication. Refer to the course planner on page 42 for details.

AUT encourages early application. Places are limited[1].

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For more details visit **aut.ac.nz/sciences**

KEY FEATURES:

- Provides direct entry from high school into a postgraduate degree
- Includes a one-semester research project
- Can offer direct entry into the PhD

SEE YOURSELF AS:

- Doing research in your chosen science specialisation
- Objective, enquiring and open to new ideas
- Motivated
- Having creative problem-solving skills

CAREER OPPORTUNITIES:

This degree prepares you for a wide range of careers in your chosen specialisation:

- Applied Conservation
- Biomedical Science
- Chemistry
- Environmental Science
- Food Science
- Geospatial Science
- Microbiology
- Molecular Genetics

Course planner – Bachelor of Advanced Science (Honours)

The papers below are compulsory for each relevant specialisation. You'll need to take additional elective papers each year to bring the total number of points per year to 120. All papers are 15 points unless stated otherwise.

SPECIALISATIONS	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)	LEVEL 8 (Year 3 & 4)
Compulsory paper for all specialisations				Research Project (45 pts or 60 pts)
Applied Conservation	TWO OF: • Plants & Animals • Ecology & Evolution • Biological Sampling & Interpretation • Human Geography	Environmental Law Research Techniques Geographic Information Systems Biogeography Conservation Planning TWO OF: • Freshwater Ecology • Terrestrial Ecology • Fish & Aquatic Plants • Marine Invertebrates • Plant & Animal Taxonomy	Applied Conservation Ecological Management & Modelling Socio-ecological Systems	FOUR OF: • International Conservation Biology • Applied New Zealand Conservation • Socio-ecological Systems Analysis • Global Change Biology • Geospatial Science for Conservation PLUS at least 1 research methodology paper
Biomedical Science	TWO OF: • Microbiology • Biological & Solution Chemistry • Biological Sampling & Interpretation • Principles of Chemistry	Biochemistry Principles of Genetics Cells, Genes & Molecules Analytical Chemistry Methods of Research & Enquiry Human Anatomy & Physiology II	Pharmacology for Professional Practice Biomedical Science Natural Compounds Biomedical Technology	Biomedical Science & Technology (30 pts) ONE OF: • Contemporary Molecular Genetics (30 pts) • Quality Assurance in Laboratory Services (30 pts) • Ethics of Biotechnology (30 pts) PLUS at least 1 research methodology paper
Chemistry	TWO OF: • Principles of Chemistry • Biological & Solution Chemistry • Biophysics	THREE OF: • Inorganic Chemistry • Analytical Chemistry • Physical Chemistry • Biochemistry • Organic Chemistry • Physical Measurement	THREE OF: • Natural Products • Environmental Chemistry • Advanced Analytical Chemistry • Organic Synthesis & Molecular Design	FOUR OF: • Physical Chemistry I • Chemistry for Drug Discovery • Biological Inorganic Chemistry I • Molecular Spectroscopy • Green & Sustainable Chemistry • Organic Chemistry II • Biological Inorganic Chemistry II
Environmental Science	TWO OF: • Plants & Animals • Ecology & Evolution • Biological Sampling & Interpretation	Environmental Risk Assessment Terrestrial Ecology Environmental Law Freshwater Ecology Research Techniques	Plant Ecology Ecological Management & Modelling Animal Behaviour & Ecology	60 POINTS FROM[1]: • Applications of GIS • Advanced Ecology • Macroecology & Biogeography • Advanced Biological Oceanography • Fisheries Science • Marine Ecosystem Functions • Marine Spatial Planning PLUS at least 1 research methodology paper
Food Science	TWO OF: • Principles of Chemistry • Food Science • Biological & Solution Chemistry • Biophysics • Microbiology • Biological Sampling & Interpretation	Analytical Chemistry Food Microbiology Food Process Engineering Food Technology Food Chemistry	Advanced Food Microbiology Advanced Food Chemistry Sensory Evaluation	60 POINTS FROM: • Food Science (30 pts) • Frontiers of Food Microbiology (30 pts) • Recent Trends in Food Science • Current Topics in Food Science (30 pts) • Advanced Sensory Analysis of Food PLUS at least 1 research methodology paper

SPECIALISATIONS	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)	LEVEL 8 (Year 3 & 4)
Geospatial Science	TWO OF: • Plants & Animals • Ecology & Evolution • Biological Sampling & Interpretation • Our Dynamic Earth	Environmental Law Research Techniques Geographic Information Systems Biogeography Planning for Environmental Sustainability	Geospatial Analysis Remote Sensing Ecological Management & Modelling	60 POINTS FROM[1]: • Advanced Ecology • Macroecology • Biogeography • Advances in Remote Sensing • Advances in Geospatial Analysis • Geospatial Customisation & Visualisation • Marine Spatial Planning • Applications of GIS • Advanced Applications in GIS • GIS Programming • Geospatial Science for Conservation • Geospatial Internship PLUS at least 1 research methodology paper
Microbiology	TWO OF: • Principles of Chemistry • Microbiology • Biological & Solution Chemistry • Ecology & Evolution	Environmental Microbiology Food Microbiology Biochemistry Industrial Microbiology Principles of Genetics Cells, Genes & Molecules	Advanced Food Microbiology Biotechnology Molecular Genetics	• Frontiers of Food Microbiology (30 pts) • Selected Topics in Microbiology (30 pts) • Contemporary Molecular Genetics (30 pts) PLUS at least 1 research methodology paper
Molecular Genetics	TWO OF: • Biological Sampling & Interpretation • Principles of Chemistry • Biological & Solution Chemistry • Microbiology	Biochemistry Principles of Genetics Cells, Genes & Molecules Research Techniques	Molecular Genetics Computational Genetics Protein & Metabolic Chemistry	60 POINTS FROM: • Ethics of Biotechnology (30 pts) • Contemporary Molecular Genetics (30 pts) • Bioinformatics • Specialist Readings PLUS at least 1 other postgraduate paper

1. Not all papers listed are 15 points. Refer to the AUT Calendar, **aut.ac.nz/calendar**

Bachelor of Medical Laboratory Science [BMLS | AK3432] Overview

QUICK FACTS

Level:	7
Points:	480
Duration:	4 years F/T, equivalent P/T
Campus:	City
Starts:	22 Feb 2021

Lon Hua
Medical Laboratory Scientist, IGENZ Limited
Bachelor of Medical Laboratory Science

"The Bachelor of Medical Laboratory Science is a multidisciplinary degree that offers not one, but two 15-week clinical placements, which helps you understand more about the work you'll be doing in the foreseeable future. The experiences gained from these clinical placements have certainly provided me with a behind-the-scenes look of what the clinical world is all about. In my role now I'm responsible for the diagnostic analysis of cancer patient DNA to detect mutations with treatment possibilities. What I enjoy most about this work is examining a sample and hopefully finding a treatable mutation that will ultimately prolong an individual's life, or at the very least improve the quality of life for a person suffering from cancer. I have always wanted to work in the medical and healthcare sector. AUT's Bachelor of Medical Laboratory Science was exactly what I was looking for."

Medical laboratory scientists play a key role in health science. They provide information about a patient's health vital to the diagnosis and treatment of disease. The Bachelor of Medical Laboratory Science prepares you for a career in this exciting field. You develop skills in accurate observation and the collection, recording and interpretation of test results. Study with us and you have access to state-of-the-art equipment, including the latest automated analysers in clinical chemistry, molecular diagnostics, immunology and haematology in the AUT Roche Diagnostics Laboratory, the first of its kind in New Zealand. Your study includes workplace experience where you can apply what you have learnt in the classroom. Once you have completed this degree and fulfilled the requirements of the Medical Sciences Council of New Zealand, you can register and practise as a medical laboratory scientist.

Entry requirements

Minimum entry requirements

University Entrance or equivalent including:

- **NCEA:** 14 or more credits in each of Biology, Chemistry and one of Calculus, Mathematics or Statistics
- **CIE:** A D grade or better at AS or A level in each of Biology, Chemistry and Statistics

Must be capable of meeting Health Practitioners Competence Assurance Act (HPCA Act) requirements including police clearance.

English language requirements

At least IELTS (Academic) 6.5 overall with all bands 6.0 or higher; or equivalent.

Required New Zealand school subjects

Biology, Chemistry, one of Calculus, Mathematics or Statistics.

Don't meet the entry requirements?

Consider starting with our Certificate in Applied Science or the Biomedical Science major in the Bachelor of Science.

What this qualification covers

Year 1

In your first year you take eight compulsory papers. These papers give you a general scientific grounding and a broader perspective on medical laboratory science.

Papers you take this year:

- Knowledge, Enquiry and Communication
- Biological and Solution Chemistry
- Human Anatomy and Physiology I
- Human Anatomy and Physiology II

- Microbiology
- Biological Sampling and Interpretation
- Principles of Chemistry
- Histology and Cytology

Year 2

Your second-year papers cover biochemistry, genetics, clinical chemistry, haematology, medical microbiology, immunology and virology, transfusion science and molecular genetics.

Year 3

You study two medical laboratory science specialisation subjects in more depth, along with pathology, methods of research and professional practice and ethics. Specialisations can be chosen from Clinical Chemistry, Haematology, Histology, Immunology, Medical Cytology, Medical Microbiology, and Transfusion Science (not all are offered every year).

Year 4 (workplace experience)

Your final year consists of two 15-week placements of 30 hours per week in New Zealand or Australia. Recent placements included:

- LabPLUS
- Labtests NZ
- New Zealand Blood Service

AUT encourages early application. Places are limited[1].

1. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

KEY FEATURES:

- Careers that are vital for the health sector
- Hands-on lab experience in NZ or Australia
- Foundation for medical laboratory scientist registration

SEE YOURSELF AS:

- A team player
- Able to troubleshoot
- An analytical thinker
- Good at communicating at all levels

CAREER OPPORTUNITIES:

This degree prepares you for a career in a diagnostic laboratory. Registered medical laboratory scientists work in public hospitals and community laboratories doing diagnostic laboratory testing across all specialisations.

Other career paths include:

- Diagnostic reagent manufacture
- Laboratory management
- Marketing of medical equipment and reagents

Course planner – Bachelor of Medical Laboratory Science

YEAR	SEMESTER 1	SEMESTER 2
1 (120 points)	Knowledge, Enquiry and Communication	Biological and Solution Chemistry
	Human Anatomy and Physiology I	Human Anatomy and Physiology II
	Microbiology	Biological Sampling and Interpretation
	Principles of Chemistry	Histology and Cytology
2 (120 points)	Biochemistry	Clinical Chemistry I
	Medical Microbiology I	Haematology I
	Immunology and Virology	Transfusion Science I
	Genetics	Molecular Genetics
3 (120 points)	Pathology I	Pathology II
	Professional Practice and Ethics (Semester 1 or Semester 2)	
	Methods of Research and Enquiry (Semester 1 or Semester 2)	
	PLUS CHOOSE 2 SPECIALISING AREAS (30 points per area made up of 2 papers)	
	Clinical Chemistry	
	Haematology	
	Histology	
	Immunology	
	Medical Cytology	
	Medical Microbiology	
	Transfusion Science	
4 (120 points)	Two clinical placements in specialising subjects (each placement is 60 points)	

480 points total

Certificate in Applied Science

CertAppSc | AK1018

Interested in science but not quite ready to start the Bachelor of Science or not sure which direction to take? The Certificate in Applied Science gives you a taste of the many options in AUT's School of Science. It's designed to help you develop the academic and study skills for study at bachelor's degree level.

Entry requirements

Minimum entry requirements

- Completion of Year 12 or equivalent
- At least 12 credits at level 2 in one subject from Biology, Chemistry, Earth and Space Science, Physics, Science; AND
- At least 12 credits at level 2 from one or more subjects from Art History, Business Studies, Calculus, Classical Studies, Drama, Economics, English, Geography, Health Education, History, Media Studies, Physical Education, Social Studies, Te Reo Māori, Te Reo Rangatira, Mathematics or Statistics

English language requirements

At least IELTS (Academic) of 5.5 overall with all bands 5 or higher; or equivalent.

What this qualification covers

You choose eight papers from the following options[1]:

- Applied Statistics
- Ecology and Evolution
- Foundation Algebra
- Foundation Biology
- Foundation Biophysics
- Foundation Chemistry
- Foundation Ecology
- Foundation Human Anatomy and Physiology
- Foundation Statistics
- Foundation Mathematics
- Introduction to Academic Writing
- Plants and Animals
- Principles of Chemistry

Career opportunities

This certificate prepares you for the Bachelor of Science. Graduates are also prepared for employment in entry-level positions in science-related industries, including laboratory assistant or trainee roles.

AUT encourages early application. Places are limited[2].

1. Paper prerequisites may apply
2. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

QUICK FACTS

Level:	4
Points:	120
Duration:	1 year F/T, up to 2 years P/T
Campus:	City
Starts:	22 Feb & 12 July 2021

Sahil Mani
4th-year student, Bachelor of Medical Laboratory Science
Certificate in Applied Science

"When I saw AUT's Bachelor of Medical Laboratory Science, I just knew this was something I wanted to do. This degree focused on pharmacokinetics and pharmacodynamics in the second and third year, which was what I was looking for in the first place. The sense of satisfaction you get when you realise how much of an impact you're making on a patient's life is one of my favourite outcomes of the Bachelor of Medical Laboratory Science. You develop a special connection to the patient even though you never see them, and that is the motivation that every good scientist has. I always thought that physicians knew what disease is manifesting in a patient just by looking at them, but this isn't always the case. Without us medical laboratory scientists, physicians are often baffled as to what disease a patient has."

Diploma in Applied Science

DipAppSc | AK3750

QUICK FACTS

Level:	5
Points:	120
Duration:	**Standard diploma:** 1 year F/T, P/T available **Pre-Chiropractic:** 1 year F/T
Campus:	City
Starts:	22 Feb & 12 July 2021

The Diploma in Applied Science is for students who want to gain knowledge in a specialised scientific discipline or are preparing to apply for chiropractic study.

There are two pathways: Standard diploma and Pre-Chiropractic.

Entry requirements

Minimum entry requirements

- Completion of Year 12
- **NCEA:** 48 level 2 credits including eight level 2 credits in any one subject from Biology, Chemistry, Earth and Space Science, Physics, Science
- **CIE:** 60 points on the UCAS Tariff, including any one subject similar to the NCEA subjects listed above

Pre-Chiropractic: Letter of Intention to NZCC from the New Zealand College of Chiropractic.

English language requirements IELTS

(Academic) 5.5 overall with all bands 5.0 or higher; or equivalent.

What this qualification covers

Standard diploma

This one-year diploma includes eight papers from Year 1 or 2 of the Bachelor of Science, including:

- Biological and Solution Chemistry
- Biological Sampling and Interpretation
- Biophysics
- Ecology and Evolution
- Plants and Animals
- Principles of Chemistry
- Health and Environment (or Hauora Māori and Environment)
- Knowledge, Enquiry and Communication
- Microbiology
- Physical and Human Geography

CAREER OPPORTUNITIES:

Standard diploma

→ Graduates with this broad foundation in science are prepared for science and laboratory work in a variety of industries. Graduates can also progress to a higher level science qualification.

Pre-Chiropractic

→ A pathway to gain entry into chiropractic college and become a registered chiropractor.

Pre-Chiropractic

This one-year diploma prepares you for the Bachelor of Chiropractic, taught through the New Zealand College of Chiropractic. You need to complete the AUT Diploma in Applied Science if you want to enrol with the college. Completing the diploma doesn't guarantee entry to the Bachelor of Chiropractic.

You study:

- Knowledge, Enquiry and Communication
- Principles of Chemistry
- Biological and Solution Chemistry
- Biophysics
- Human Anatomy and Physiology I
- Human Anatomy and Physiology II
- Microbiology

You also choose one elective from the Bachelor of Science.

For more information regarding the Bachelor of Chiropractic please contact:

New Zealand College of Chiropractic
6 Harrison Road
Mt Wellington, Auckland
+64 9 526 6789

AUT encourages early application. Places are limited[1].

1. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

Dr Kevin Kantono
Sensory Scientist, Arla Foods, Aarhus, Denmark
Doctor of Philosophy
Bachelor of Science (Honours) (First Class)
Bachelor of Science in Food Science
Diploma in Applied Science

"As a researcher, I'm responsible for developing the area of sensory and consumer science at Arla Foods, both internally and externally through collaboration with research institutes and universities globally. I'm also the key sensory scientist for Arla's Calcium business transformation programme in complexity reduction, and in sugar reformulation where we aim to deliver our nutrition promise in reducing sugar intake.

"Arla is the fourth biggest dairy producer in the world, spread out across 120 countries, and our product is sold in 145 countries worldwide. The 11,200 farmers who own Arla produce 14 billion kilograms of milk per year.

"I constantly use what I've learnt from my AUT food science papers on a day-to-day basis, with the main focus on sensory evaluation, but also on food physics, chemistry and microbiology. My project management skills, adaptability and ability to work to deadlines are also all paying off.

"I studied at AUT long enough to know that AUT has the best student support services, engaging staff and lecturers, and amazing hands-on labs. AUT will support you with all sorts of issues that students encounter, whether they're academic or personal. I also loved that the science programmes are flexible and very relevant."

Graduate Diploma in Science

GradDipSc | AK1042

Graduate Certificate in Science

GradCertSc | AK1043

Already have a degree? Upskill or change direction in your science career with the Graduate Certificate or Graduate Diploma in Science. These qualifications are aimed at current industry practitioners, including medical laboratory technicians upskilling to become medical laboratory scientists, microbiologists changing direction to enter the aquaculture industry, or health degree graduates transferring to anaesthetic technology. They offer excellent preparation for postgraduate study in a science discipline in which you were not originally trained, for example in the Postgraduate Certificate in Science, Postgraduate Diploma in Science or Master of Science.

Entry requirements

- A bachelor's degree OR
- Relevant professional qualification or experience approved by the Dean (or representative) to be equivalent to a degree.

English language requirements

IELTS (Academic) 6.5 overall with all bands 6.0 or higher; or equivalent.

What these qualifications cover

You can update your knowledge within applied conservation, biomedical science, chemistry, environmental sciences, food science, food safety, geospatial science, health protection, marine biology, anaesthetic technology and microbiology.

Papers can be chosen from the Bachelor of Science. If you are a medical laboratory technician seeking to upgrade your qualifications, you must discuss your programme of study with your employer.

AUT encourages early application. Places are limited[1].

1. We encourage you to apply as soon as applications are open. Places are limited, and in many programmes there are more applications than available places. Once we have received your application, we may ask you to provide further information. Your application can only be assessed when you have provided all of the information requested.

For more details visit **aut.ac.nz/sciences**

Graduate Diploma in Science

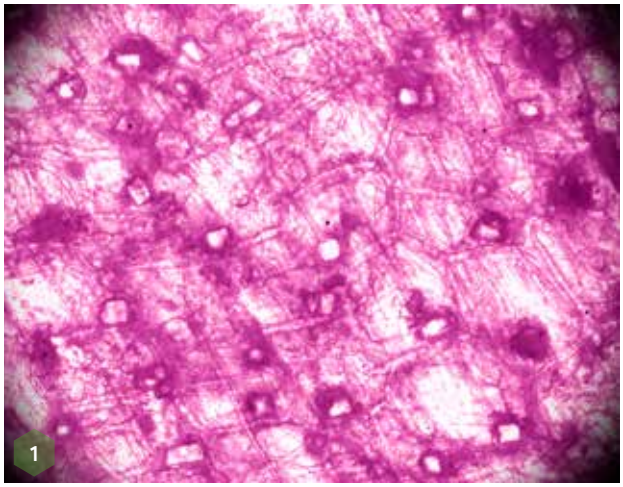
QUICK FACTS

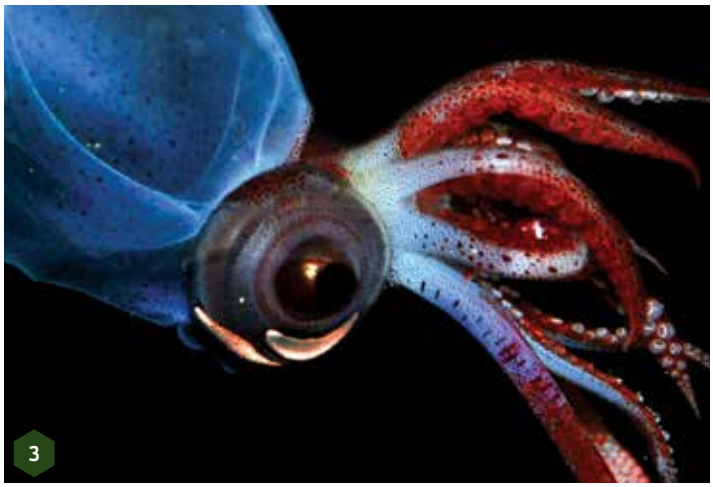
Level:	7
Points:	120
Duration:	1 year F/T, 2 years P/T
Campus:	City
Starts:	22 Feb & 12 July 2021

Graduate Certificate in Science

QUICK FACTS

Level:	7
Points:	60
Duration:	½ year F/T, 1 year P/T
Campus:	City
Starts:	22 Feb & 12 July 2021





1 & 7 AUT science students have access to advanced technology and labs 2 AUT scientists using drones for ground-breaking conservation monitoring in Antarctica 3 The AUT Lab for Cephalopod Ecology and Systematics researches cephalopods (mostly squid) that live in NZ waters 4 Learn in our modern lecture theatre facilities 5 Students at the AUT City Campus 6 & 8 Field trips are an important part of our programmes, including opportunities to go out on AUT's custom-made boat or outings to study the ecology of Ruapehu

Overview of our postgraduate qualifications

Bachelor of Science (Honours) (120 points)

The 120-point Bachelor of Science (Honours) is aimed at high-achieving students in the Bachelor of Science who want to advance their skills and make their CV stand out. It can also serve as a pathway to advanced research at master's level or direct access into a PhD. You complete a research methods paper, advanced papers as well as a supervised research project/dissertation.

Bachelor of Advanced Science (Honours) (480 points)

For more information about the Bachelor of Advanced Science (Honours) refer to page 40.

Postgraduate Certificate in Science and Postgraduate Diploma in Science

These qualifications equip students with advanced knowledge in science, with papers drawn from the Master of Science. The Postgraduate Certificate in Science takes one semester of full-time study, and the Postgraduate Diploma in Science takes one year of full-time study. Graduates may be able to progress to further study in the Master of Science.

Master of Science (180 points)

In as little as one year, science graduates can gain advanced research skills and knowledge in one of: Applied Conservation, Biomedical Science, Chemistry, Environmental Science, Food Science, Geospatial Science, Microbiology or Molecular Genetics.

Master of Science (Research) (240 points)

The Master of Science takes two years of full-time study, and includes taught papers and a one-year supervised research thesis. Choose from: Applied Conservation, Biomedical Science, Chemistry, Environmental Science, Food Science, Geospatial Science, Microbiology or Molecular Genetics.

Postgraduate Certificate in Medical Laboratory Science and Postgraduate Diploma in Medical Laboratory Science

These coursework qualifications provide you with specialist skills in medical laboratory science. You can follow a management or specialised scientist pathway. The Postgraduate Certificate in Medical Laboratory Science takes six months of full-time study, and the postgraduate diploma takes one year of full-time study. Graduates may be able to progress to the Master of Medical Laboratory Science.

Master of Medical Laboratory Science

As a Master of Medical Laboratory Science graduate you have advanced knowledge and understanding of your chosen field of medical laboratory science. You can follow either a management or specialised scientist pathway. This programme takes two years of full-time study, and includes taught papers and a one-year supervised research thesis.

Master of Philosophy

The Master of Philosophy is a one-year research only master's degree. It gives you the opportunity to undertake a research project of an applied or professional nature. It can also serve as a pathway to more advanced research at doctoral level.

Doctor of Philosophy

The Doctor of Philosophy (PhD) is a thesis-based research degree that leads to advanced academic and theoretical knowledge in a specialist area. The programme enables you to make an original contribution to knowledge or understanding in your field. You work closely with a supervisor to prepare a thesis, which is then examined by independent experts applying contemporary international standards.

For more details visit **aut.ac.nz/sciences**

The City Campus – home of AUT's science programmes

HOW TO APPLY

Below is the step-by-step guide to the applications process. For more information visit aut.ac.nz/apply

1

APPLY EARLY

Places are limited. Submit your application well before the semester starts.

APPLYING FOR 2021

- Semester 1
  – apply by 7 December 2020
- Semester 2
  – apply by 3 May 2021

2

COMPLETE THE APPLICATION FORM

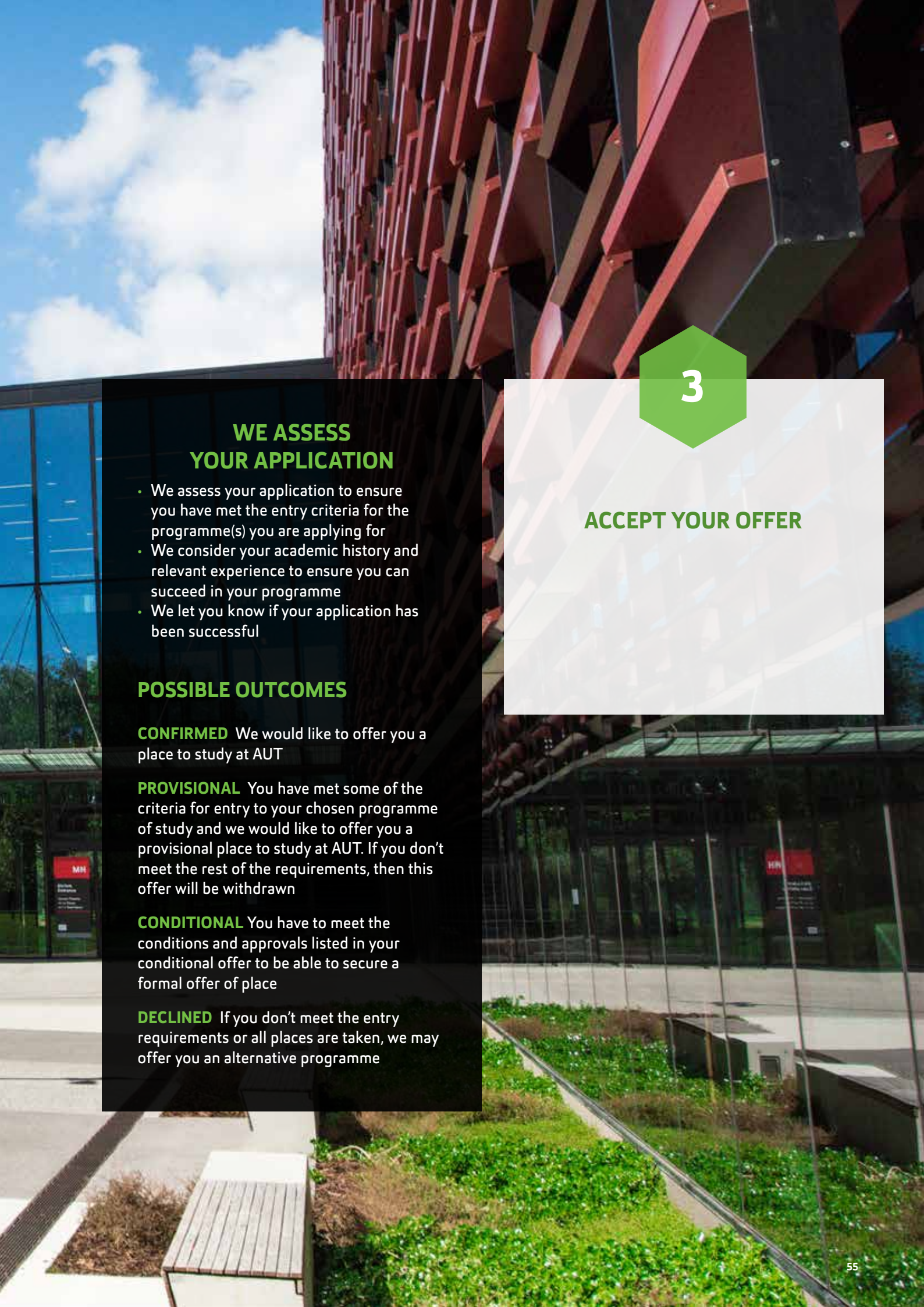
- Apply online
- Indicate your programme(s) of choice and major (if known)

International students can also apply using an AUT approved international agent. For a list of AUT registered agents visit **aut.ac.nz/international-agents**

SUBMIT YOUR APPLICATION

WE ACKNOWLEDGE YOUR APPLICATION

- We will send you an acknowledgment email, which explains how to check the status of your application
- We will contact you if we need more information



WE ASSESS YOUR APPLICATION

- We assess your application to ensure you have met the entry criteria for the programme(s) you are applying for
- We consider your academic history and relevant experience to ensure you can succeed in your programme
- We let you know if your application has been successful

POSSIBLE OUTCOMES

CONFIRMED We would like to offer you a place to study at AUT

PROVISIONAL You have met some of the criteria for entry to your chosen programme of study and we would like to offer you a provisional place to study at AUT. If you don't meet the rest of the requirements, then this offer will be withdrawn

CONDITIONAL You have to meet the conditions and approvals listed in your conditional offer to be able to secure a formal offer of place

DECLINED If you don't meet the entry requirements or all places are taken, we may offer you an alternative programme

3

ACCEPT YOUR OFFER

University admission to AUT bachelor's degrees

For New Zealand citizens and residents and international students studying in a high school in New Zealand

To gain admission to bachelor's degrees, you must have met the requirements for University Entrance plus any specified admission requirements for a programme, such as specific subjects, portfolios and interviews.

For more information on entry requirements, including entry requirements for international students, refer to the AUT Calendar or visit **aut.ac.nz/calendar**

Please note: AUT, like all other New Zealand universities, is required to manage enrolments. This is because of government policies that restrict the number of funded places available for domestic students in tertiary education.

Admission categories
You may be granted University Entrance under one of the following categories:

- NCEA University Entrance
- Ad Eundem Statum admission (at an equivalent level) – this includes Cambridge International Examinations (CIE) and International Baccalaureate Diploma Programme (IB)
- Discretionary Entrance
- Special Admission

Common University Entrance requirements

STANDARD	NCEA	CIE	IB[2]
Overall	Require **NCEA level 3** certificate which consists of 80 credits, including at least 60 credits at level 3 or higher. Can include up to 20 credits at level 2. **Note:** Credits to achieve NCEA level 3 may include unit standards from non-approved subjects. **Subject credits** Total of 42 level 3 credits including: • 14 credits from one approved subject • 14 credits from a second approved subject • 14 credits from a third approved subject	A minimum of 120 points on the UCAS Tariff[1] at A or AS level from an approved list (equivalent to NCEA approved subject list). Must include at least three subjects (excluding Thinking Skills) with grades D or above.	IB Diploma with minimum 24 points
Numeracy	At least 10 level 1 (or higher) numeracy credits (can be achieved through a range of subjects)	A minimum grade of D in IGCSE[3] mathematics or any mathematics subject at AS or A level.	Any mathematics subject – IB Group 5
Literacy	Total of 10 level 2 (or higher) literacy credits including: • 5 reading credits • 5 writing credits From specific standards in a range of NZQA English language rich subjects.	A minimum grade of E in English Language and/or English Literature subject at AS or A level.	Literature or language and literature (SL or HL) – IB Group 1, with English as the language.

1. UCAS (Universities and Colleges Admissions Services for the UK) Tariff = system which converts AS and A level grades into points.
2. New Zealand residents who have taken IB but have not been awarded the Diploma may apply for discretionary entrance.
3. IGCSE = International General Certificate of Secondary Education.

Where programmes require a specific subject, it is expected that a student will have achieved a minimum of 14 NCEA credits in that subject (or equivalent), unless indicated otherwise.

NCEA approved subjects

For a list of NCEA approved subjects for University Entrance visit the NZQA website, **nzqa.govt.nz**

AUT language rich subject list

Art History, Business Studies, Classical Studies, Drama, Economics, English, Geography, Health Education, History, Media Studies, Physical Education, Social Studies, Te Reo Māori, Te Reo Rangatira.

Alternative pathways into AUT bachelor's degrees

Students who have just missed University Entrance or did not get into their chosen degree could consider enrolling in one of the foundation programmes offered at AUT. Please visit **aut.ac.nz/universityentrance**

Discretionary Entrance

Discretionary Entrance is available to applicants who have attained a high level of achievement in Year 12 and want to undertake university study.

International students can't apply for Discretionary Entrance.

You can apply if you:

- Have not completed Year 13 in a New Zealand secondary school or have done Year 13 but not attempted to gain University Entrance
- Have not otherwise qualified for admission (or have attempted University Entrance)
- Are a domestic student (New Zealand or Australian citizen or permanent resident). If Australian, your most recent schooling must have been in New Zealand
- Are under 20 years of age on the first day of the semester in which you begin study and meet other requirements of the programme for which you apply

People who missed University Entrance in Year 13 may be considered for mid-year admission in the following year.

You can't apply for admission for Semester 1 if you studied in Year 13 after 1 June. However, you can apply for admission into Semester 2.

Minimum academic criteria for Discretionary Entrance

- NCEA level 2 certificate endorsed with minimum of Merit or CIE/IB equivalent
- Minimum of 14 credits in each of four NCEA level 2 (or higher) subjects, at least three of which must be on the approved subject list
- Meet UE literacy and numeracy standards, or their equivalent.

The application is a two-step process. First, you indicate you want to apply through Discretionary Entrance on the standard application form. If you meet the criteria you are sent a second form in which you provide further information and a school recommendation.

The recommendation will provide proof of your maturity, motivation, capability and readiness to undertake degree-level study and also verify that you were not enrolled in Year 13 beyond 1 June in the year prior to admission. Please refer to the AUT Calendar or visit **aut.ac.nz/calendar**

Please note: Applicants are considered on a case-by-case basis and must also meet other selection criteria for the programme for which they have applied. There is a non-refundable assessment fee of $50.00.

Admission at equivalent level (Ad Eundem Statum)

An applicant will be considered for Ad Eundem Statum admission if they:

- Have successfully gained University Entrance through CIE or IB or an approved qualification from a New Zealand secondary school of special character
- Have successfully completed a recognised foundation programme or other recognised tertiary qualification/ study of at least 120 points at level 3, or at least 60 points at level 4 in one course of study and have completed Year 13 at a NZ secondary school, or equivalent.
- Have qualifications from an overseas secondary school or tertiary institution deemed by AUT to be sufficient for entry into an undergraduate degree programme.

Please note: Applicants will be required to supply an official academic transcript with their application.

Bursary

If you sat Bursary (prior to 2004) rather than NCEA please refer to the AUT Calendar or visit **aut.ac.nz/calendar**

Special Admission

New Zealand citizens or residents who are over 20 years of age on or before the first day of semester can apply for degree-level entry through Special Admission.

English language requirements

If you don't have English as your first language, you may have to show evidence of your English language skills.

International students studying at secondary school and applying for University Entrance must achieve UE Literacy through New Zealand secondary school qualifications NCEA, CIE or IB. IELTS can't be substituted.

In all other cases another form of English language testing is required. Minimum IELTS requirements for each programme are included on the relevant pages in this publication. For other recognised English tests and more information, visit **aut.ac.nz/englishrequirements**

International students

Contact us for information regarding studying at AUT if you're not a citizen or permanent resident of New Zealand or Australia, or a citizen of the Cook Islands, Niue or Tokelau islands.

Visit **aut.ac.nz** for entry requirements for specific countries.

If you have any questions, you can contact us at **aut.ac.nz/enquire**

Fees & scholarships

Cost is an important factor when thinking about university study. This page gives you an idea of the approximate tuition fees at AUT, and different options to help you fund your education including scholarships, student loans and allowances.

To give you an idea of approximate costs, the 2020 tuition fees are shown below (based on full-time study and completing 120 points per year). All fees are in NZ dollars and include GST. The 2021 tuition fees will be advertised on **aut.ac.nz/fees** as soon as they have been set.

Domestic student tuition fees

First-time domestic students are entitled to one year of fees free.

Undergraduate programmes

Fee (per year)	**$3,356.00-$8,711.00**[1, 2]

Bachelor of Advanced Science (Honours)

Fee (per year)	**Approximately $8,711.00**

1. This fees range includes 60-point (one-semester) programmes.
2. Part-time students pay a proportion of the fee based on the number of academic points they are studying.

International student tuition fees

Undergraduate programmes

Fee (per year)	**$17,206.00-$37,688.00**[1]

Bachelor of Advanced Science (Honours)

Fee (per year)	**Approximately $36,895.00**

1. This fees range includes 60-point (one-semester) programmes.

Other fees you may have to pay:

- 2020 Compulsory Student Services Fee – $760.00 for 120 points or $6.33 per academic point
- 2020 Building Levy – $76.00 for 120 points or $0.63 per academic point
- Additional fees for course materials or elective papers (check with your faculty if there are additional fees for your programme)

Please note that you have to pay your fees in full by the date specified on your fees invoice.

To find out more about fees call **+64 9 921 9779** or **0800 AUT AUT** (0800 288 288).

Free fees for your university study

New government policy means that eligible domestic students starting tertiary education receive one year of full-time study fees-free[1].

To check if you're eligible for fees-free study in 2021 visit **aut.ac.nz/fees**

1. Domestic students only, not available to international students.

Scholarships and awards

Scholarships and awards are a great way to fund your university study. There is a wide range of scholarships and awards available to AUT students at all stages of their study. Visit the scholarships website for a current list of scholarships offered by AUT and external funders, as well as application forms and closing dates. You can also contact AUT's Scholarships Office for advice on scholarships, awards and the scholarship application process.

To find out more call **+64 9 921 9837** or visit **aut.ac.nz/scholarships**

Support for scholarship students

Undergraduate scholarship students – whether the scholarship was awarded for academic endeavour or for excellence in sports, culture or leadership – have access to an extensive programme of support, including professional development and networking opportunities, and one-on-one support.

Student loans and allowances[1]

If you are a full-time domestic student, you may qualify for a student loan or allowance. Student loans and allowances are administered and paid by StudyLink. The application process can take some time, so it's a good idea to apply early. You can apply for a student loan or student allowance before your enrolment at AUT is complete.

To find out more call **0800 88 99 00** or visit **studylink.govt.nz**

1. For domestic students only

Help with planning and budgeting

We know that sometimes things happen and financial stress can impact your academic success. That's why we offer financial support that ranges from offering grocery or fuel vouchers, to helping with that unexpected bill.

StudyLink website

Visit **studylink.govt.nz** for tools, tips and information to help you plan and understand the costs you will have while studying.

Find out more

AUT Open Day

Our Open Day at the City Campus will showcase everything AUT has to offer to help you make an educated decision about university study. To find out more visit **aut.ac.nz/live**

Visit our website

For the latest information on AUT programmes and to keep up-to-date with what's happening at AUT visit **aut.ac.nz**

Contact us online

If you have any questions about studying at AUT, you can contact us at **aut.ac.nz/enquire**

Secondary schools

If you are a secondary school teacher or career advisor, our Future Students Team can help you with any questions you may have. Contact the team on **secondary.schools@aut.ac.nz**

Connect with us

AUT has a range of social media channels to keep our students and the general public aware of what is going on around the university.

Connect with us now:

@autuni #autuni

Need some guidance?

If you're still unsure what to do, or would like to check out the campus and facilities, you can contact our Future Students Team. Email **future@aut.ac.nz** or call **0800 AUT AUT** (0800 288 288) to speak to one of our friendly advisors.

Drop in and see us

AUT Student Hub

City Campus
Level 2, ground entry, WA building, 55 Wellesley Street East, Auckland

North Campus
AS building, 90 Akoranga Drive, Northcote, Auckland

South Campus
MB building, 640 Great South Road, Manukau, Auckland

Take a virtual campus tour

To take a virtual tour of our campuses visit **aut.ac.nz/virtualtour**

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Campus map

Key

- AUT Student Hub
- Café
- Conference facility
- Intercampus shuttle bus stop
- Mobility parks
- Student lounge
- Gym
- Library
- Creche
- Breastfeeding and baby change room

City Campus

55 Wellesley Street East
Auckland Central

SCIENCE

UNDERGRADUATE PROGRAMME GUIDE 2021

AUT

0800 AUT AUT (0800 288 288)
Auckland University of Technology
Auckland, New Zealand
aut.ac.nz

Enquire now
aut.ac.nz/enquire

CITY CAMPUS
55 Wellesley Street East, Auckland Central

NORTH CAMPUS
90 Akoranga Drive, Northcote, Auckland

SOUTH CAMPUS
640 Great South Road, Manukau, Auckland

Connect with us now:

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