SCIENCE

UNDERGRADUATE PROGRAMME GUIDE
2018

AUT

89%

AUT graduates have work experience where they apply their learnings

5
OUT OF 5

EMPLOYABILITY
QS STARS 2017

TOP 3%
UNIVERSITIES WORLDWIDE

Welcome to Science

Welcome to your future.

Today's world needs people who understand science and the contribution it makes to society.

Environmental sustainability, conservation, innovative and efficient food production, geospatial science and chemical synthesis techniques are some of the key ingredients for the future viability of our economy and society. Science at AUT is strong in these disciplines and we are well placed to contribute to these critically important areas.

Our programmes are developed with employers and underpinned by world-leading research. We offer a wide scope of study opportunities in both general and specialist areas of science, including chemistry, biogeography, biology, medical laboratory science, biomedical science, plant ecology, marine biology, geographic information systems (GIS) and geospatial science, food science, food safety, applied conservation, evolutionary biology, health protection, microbiology, global change ecology and molecular genetics.

We provide graduates with the skills necessary to gain rewarding employment, which enables an ongoing contribution to scientific innovation, excellence and society wellbeing. We aim to provide students with a positive legacy for themselves and for AUT. Our teaching and research are focused on contributing to environmentally, socially and economically sustainable development.

Science at AUT is growing at an exponential rate. I invite you to check out why.

Professor Len Gillman
BSc, PhD *Auck.*
Head of School, School of Science

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

Image 2 on page 5 and image 8 on page 9 by Evan Brown. Image on page 42–43 by Simon Devitt Photographer

Cover: 89% work experience (AUT Annual Report 2016), 5 out of 5 (QS Stars University Rating 2017), Top 3% (Universities New Zealand website www.universitiesnz.ac.nz)

The information contained in this programme guide is primarily intended for domestic students. International students should visit **www.aut.ac.nz/international**

The information contained in this programme guide was correct at the time of print, May 2017.

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 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
- Colab: Creative Technologies
  Marautanga Matatini

TE ARA POUTAMA
FACULTY OF MĀORI AND INDIGENOUS DEVELOPMENT

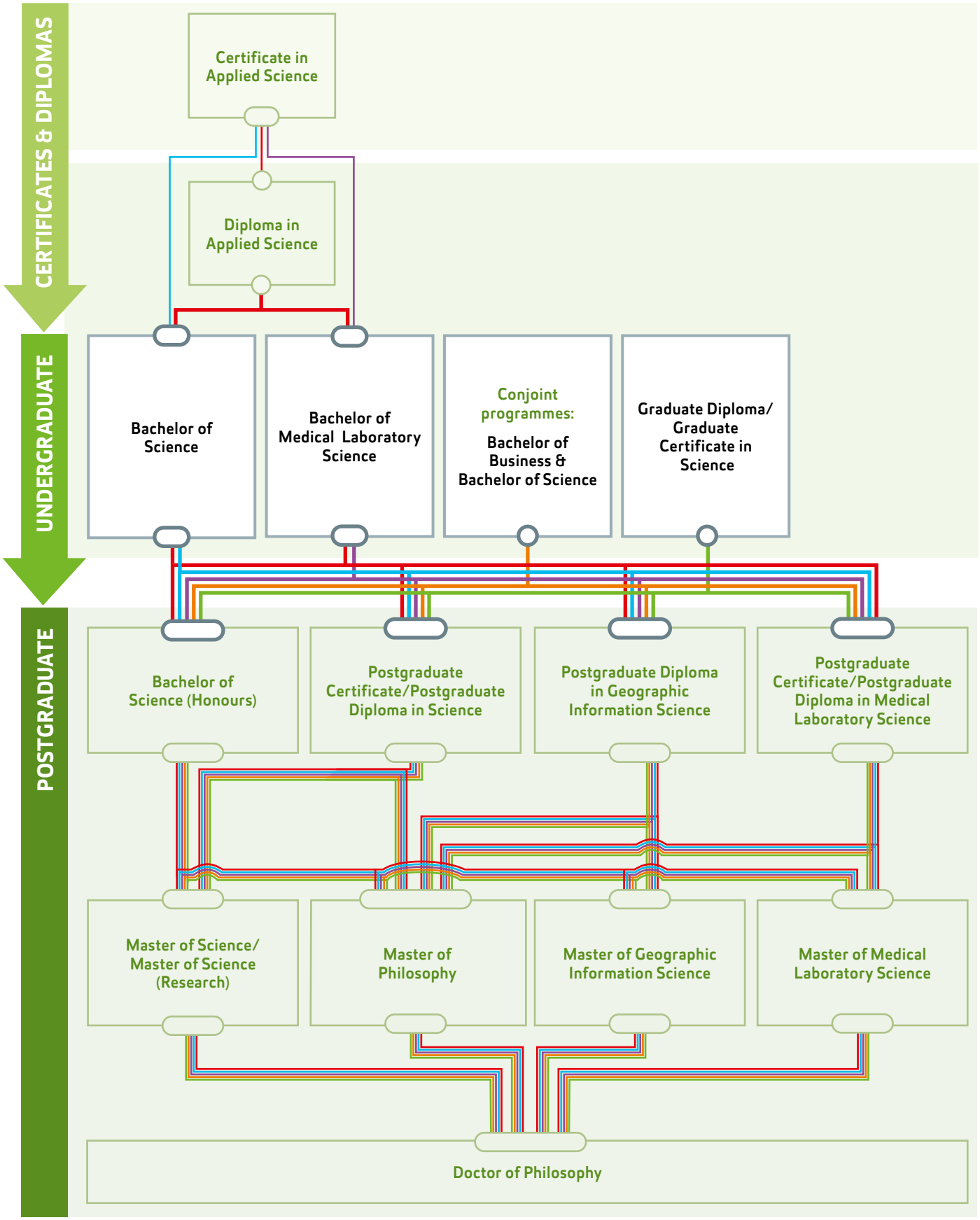
FACULTY OF CULTURE AND SOCIETY
TE ARA KETE ARONUI

- 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 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 Whakamahi Pūtaiao
- School of Sport and Recreation
  Te Kura Hākinakina

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, contact the AUT Student Hub on 0800 AUT UNI (0800 288 864) or visit **www.aut.ac.nz/sciences**

Why study science?

Our research scientists work with leading organisations like NASA

Study science majors not available anywhere else in NZ

Nationally and internationally recognised lecturers

1 The AUT City Campus in the heart of Auckland City 2 Our annual field trip to the Solomon Islands is one of many ways our students can hone their skills
3 AUT researchers have pioneered the use of unmanned aerial vehicles for applied conservation research around the world

Preparing you for rewarding science careers

Study science with us and you'll be prepared for rewarding careers in a wide range of industries and professions. AUT science graduates excel in shaping successful careers in many scientific fields, in New Zealand and around the world. We're ranked as one of the top young universities in the world, and QS World University Rankings place AUT in the top 3% of universities worldwide. 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.

Strong links with employers

We're 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 ensure that your programme is relevant to your career and provide you with invaluable networking opportunities, making it easy to move from your studies to the working world. It's one of many reasons 9 out of 10 AUT graduates recommend us as a great place to study.

Research that matters

Our research focuses on scientific issues of regional and global significance – research that makes a difference to the world we live in. AUT research is concentrated into four thematic areas: applied ecology, chemistry, biomedical science and food science. The common theme connecting all research areas is sustainability, in the broadest sense as it relates to environmental and human wellbeing. Our staff are world-class researchers, and constantly draw on their own experience and research to inform their teaching

Industry-standard facilities

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.

Innovative and open-minded learning

As you would in the workplace, as an AUT student you work with people from different disciplines – students, staff or industry contacts. This approach creates a close-knit, supportive environment, and for many of our students it's the highlight of their studies.

University life

As an AUT student you study at a modern and innovative university, and have the chance to meet new people and develop lifelong skills, while getting the support you need to succeed at university and beyond.

At AUT, we celebrate diversity. Our students come from 140 different countries, and we're proud to be the only university that has the Rainbow Tick. Join us, and you'll quickly learn how inclusive and caring our community is.

We offer some of the most comprehensive student support services in New Zealand, including:

- Orientation for all new students
- Student Hub – with dedicated advisors to help with any issue
- Accommodation on campus
- AuSM – AUT student association and clubs
- International student support
- Sport and fitness centres – supporting everyone from elite athletes to social sports teams
- Childcare centres
- Māori student support
- Pacific student support
- Chinese-speaking student support
- Disability student support and resources
- Employability and Careers Hub
- Health, Counselling and Wellbeing centres
- IT support and computer labs
- Library and student learning services
- Rainbow community network and resources
- Student financial services and scholarships office

To find out more about what it's like to study at AUT visit www.aut.ac.nz

Hui Xi

Bachelor of Science (Honours) student
Bachelor of Science in Chemistry

"AUT's Employability Lab helped me look for work outside of AUT and get an internship. I studied chemistry, but also became interested in food science. I wanted to do an internship to see what I thought of food science and get a better idea of future careers in this area before committing to focus on food science for my Bachelor of Science (Honours). Through AUT's Employability Lab, I took workshops on job interviews, assessment centres, CVs and cover letters. The staff also helped me put the workshop learnings into practice, and think through what I'd really like to be doing for my future career. This helped me feel well-prepared for my career."

Helping you succeed

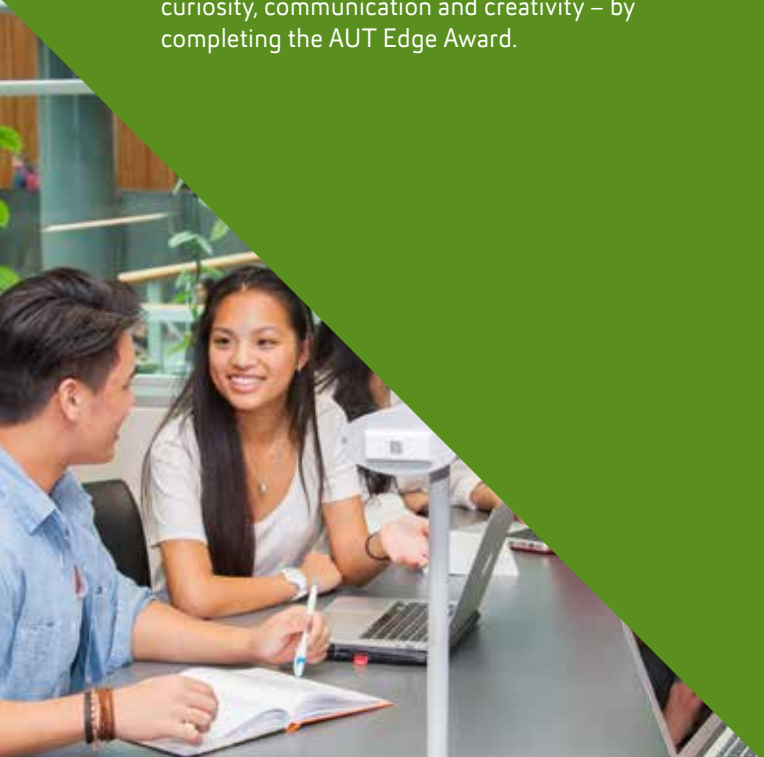
Our library and learning support team offers a wide range of services and resources, including access to an extensive collection of print and online databases, as well as workshops to help you get a head start on your studies. Drop in any time, we're happy to help any way we can.

Study overseas as part of your degree

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, and immerse yourself in another culture, make lifelong friends and get international experience before you graduate.

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. Be recognised for your 'C skills' – collaboration, co-operation, community, curiosity, communication and creativity – by completing the AUT Edge Award.



Easy to get help

The AUT Student Hub is the place to go for help. Located on each campus, the Student Hub provides a range of services, from academic or personal advice to questions about fees and support for our diverse student communities.

Support for first-year students

Studying at university can be quite an adjustment. That's why AUT is proactive in helping you transition to university life. From Orientation to our peer mentoring programme where senior students share their experience with you, our student support services make a huge difference to life as a first-year student.

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 NZ, Canada and the USA – including Facebook, Paramount Recording Studios, the Sundance Institute, Oxfam, the Metropolitan Museum 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.

Practical experience during your study

At AUT you don't just learn academic knowledge related to your discipline, but also develop essential practical skills and experience of the wider world.

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:

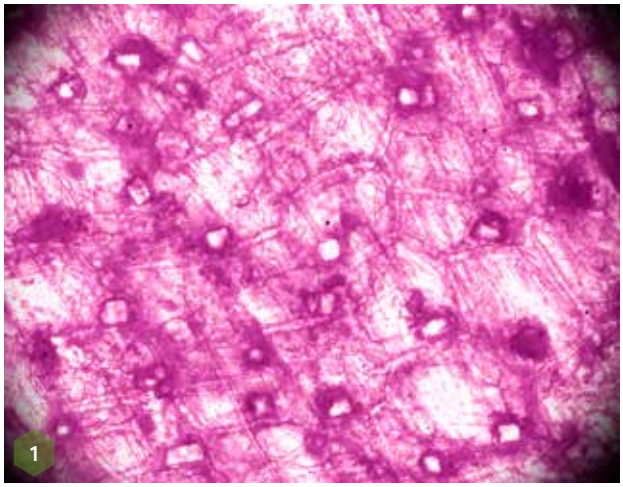
- AgResearch
- Auckland Council
- Department of Conservation
- Drapac Co. (NZ)
- Future Cuisine Ltd
- Goodman Fielder
- LabPLUS
- Labtests NZ
- McCowley Enterprises Ltd
- Merit Meats Ltd
- New Zealand Blood Service
- New Zealand Premium Whitebait Ltd
- NIWA
- OceaNZ Blue
- Olivado NZ
- Sanitas NZ
- SCION (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.

Tony Cole

Medical Laboratory Scientist, Automation and Laboratory Support Services, LabPLUS, Auckland City Hospital
Bachelor of Medical Laboratory Science

"I really enjoyed the great practical experiments, and the two 15-week clinical placements in my final year at AUT. The lecturers were excellent and I made many friends during my time at AUT. I came here for a clinical placement as part of my AUT degree, and was then offered a permanent role here after I graduated from university. It's a busy environment, and I love working alongside such knowledgeable colleagues. I really enjoy the problem-solving aspects of this role, and being able to use my knowledge to improve our processes. I'm constantly applying what I learned at AUT in my work now. For example, the practical analytical and problem-solving skills I developed at AUT are skills I apply on a daily basis."



1, 3 & 7 AUT science students have access to advanced technology and labs 2 AUT scientists using drones for ground-breaking conservation monitoring in Antarctica 4 Learn in our modern lecture theatre facilities 5 The Geospatial Science major covers the skills to shape the physical spaces people live in 6 & 8 Field trips are an important part of our programmes, including opportunities to go out on AUT's custom-made boat

Bachelor of Science Overview [BSc | AK1041]

QUICK FACTS

Level:	7
Points:	360
Duration:	3 years F/T, 6 years P/T[1]
Campus:	City
Starts:	26 Feb & 16 July 2018

Chris Puliuvea
Master of Science student
Postgraduate Diploma in Science
Bachelor of Applied Science in Applied Microbiology

"I've always wanted to know how things work and why certain things happen, so I thought a science degree would help me answer these questions. During my undergraduate degree I discovered genetics, and I've been fascinated by it since then. I love the environment and atmosphere at AUT! The lecturers are extremely helpful, easy to get along with and so experienced in their individual fields. They often share their own experience of postgraduate study and are very understanding of the challenges students face. Opportunities to make contacts with industry organisations or other scientists are a high point of my studies. The contacts I've made at Plant & Food Research, for example, are extremely helpful for my laboratory work and research, but are also a great source of new ideas and ways to improve experimental findings."

Studying a Bachelor of Science is guaranteed to quench your thirst for knowledge about the world, and will be the start of a lifelong career in science. Study with us and you have access to 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. We work closely with key organisations, including the Department of Conservation, Department of Primary Industries, New Zealand Antarctic Research Institute, Hubbard's Foods Ltd and Fonterra. 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

Selection criteria

Preference will be given to applicants who have two or more science subjects

Preferred school subjects

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

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

What this qualification covers

Year 1

All students take the papers Health and Environment, and Knowledge, Enquiry and Communication, 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 fee-only 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 **www.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 (late May 2017). 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 **www.aut.ac.nz/sciences**

Study science majors not available anywhere else in NZ

Veasna Vann
Quality Control Technician,
Epicurean Dairy Limited
Bachelor of Science in Food Science

"I love being healthy, therefore what I eat concerns me. I've always wondered how processed foods are made, and whether they're safe and nutritious for me and the people I love. Studying food science was a way of satisfying my curiosity. A qualification in food science is rewarding – it's listed on the New Zealand government skills shortage list, and there's also global demand for qualified food science professionals. Since AUT has strong industry relations, during my final year of study I was involved in new product development at a large New Zealand food company. I was able to learn every single part of the process from initial concept to the final prototype. My current role includes quality checks, in-house lab testing and preparation of the batch recipes. I love being able to contribute to the creation of safe and nutritious food products."

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 papers for all majors	Knowledge, Enquiry & Communication Health & Environment		
Applied Conservation	Plants & Animals Ecology & Evolution Biological Sampling & Interpretation Physical & Human Geography PLUS 2 level 5 electives	Environmental Law Research Techniques Geographic Information Systems Biogeography Conservation Planning TWO OF: • Freshwater Ecology • Terrestrial Ecology • Fish & Aquatic Plants • Marine Invertebrates PLUS 1 elective	Applied Conservation Ecosystem Management Socio-ecological Systems PLUS 5 electives OR 3 electives & Research Project
Biomedical Science	Principles of Chemistry Biological Chemistry Microbiology Biological Sampling & Interpretation Human Anatomy and Physiology I PLUS 1 level 5 elective	Analytical Chemistry Human Anatomy & Physiology II Methods of Research & Enquiry Genetics Biochemistry PLUS 3 electives	Pharmacology for Professional Practice Natural Compounds Biomedical Science Biomedical Technology PLUS 4 electives OR 2 electives & Research Project
Chemistry	Principles of Chemistry Biological Chemistry Biophysics PLUS 3 level 5 electives	• Analytical Chemistry • Physical Chemistry • Biochemistry • Organic Chemistry PLUS 4 electives	THREE OF: • Environmental Chemistry • Natural Products • Advanced Analytical Chemistry • Advanced Organic Chemistry • Advanced Food Chemistry PLUS 5 electives OR 3 electives & Research Project
Environmental Sciences	Plants & Animals Ecology & Evolution Biological Sampling & Interpretation PLUS 3 level 5 electives	Environmental Risk Assessment Terrestrial Ecology Environmental Law Freshwater Ecology Research Techniques PLUS 3 electives	Plant Ecology Ecosystem Management Animal Behaviour and Ecology PLUS 5 electives OR 3 electives & Research Project
Food Safety	Principles of Chemistry Food Science Biological Chemistry Microbiology Biological Sampling & Interpretation PLUS 1 level 5 elective	Environmental Risk Assessment Analytical Chemistry Food Microbiology Communicable Diseases Quality Assurance PLUS 3 electives	Food Industry Legislation Food Safety Systems Health Protection Advanced Food Microbiology PLUS 4 electives OR 2 electives & Research Project

Majors	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)
Food Science	Principles of Chemistry	Analytical Chemistry	Advanced Food Microbiology
	Food Science	Food Microbiology	Advanced Food Chemistry
	Biological Chemistry	Process Engineering	Sensory Evaluation
	Biophysics	Food Technology	PLUS 5 electives
	Microbiology	Food Chemistry	OR 4 electives & Food Product Development
	Biological Sampling & Interpretation	PLUS 3 electives	OR 3 electives & Research Project
Geospatial Science	Plants & Animals	Environmental Law	Geospatial Analysis
	Ecology & Evolution	Research Techniques	Remote Sensing
	Biological Sampling & Interpretation	Geographic Information Systems	Ecosystem Management
	Physical & Human Geography	Biogeography	PLUS 5 electives
	PLUS 2 level 5 electives	Planning for Environmental Sustainability	OR 3 electives & Research Project
		PLUS 3 electives	
Health Protection	Principles of Chemistry	Environmental Risk Assessment	Geospatial Analysis
	Plants & Animals	Food Microbiology	Food Industry Legislation
	Microbiology	Environmental Health	Health Protection
	Biological Sampling & Interpretation	Environmental Microbiology	PLUS 5 electives
	Epidemiology	Geographic Information Systems	OR 3 electives & Research Project
	PLUS 1 level 5 elective	Communicable Diseases	
		PLUS 2 electives	
Marine Biology	Plants & Animals	Fish & Aquatic Plants	Marine Ecology
	Ecology & Evolution	Marine Invertebrates	Ecosystem Management
	Biological Sampling & Interpretation	Research Techniques	Oceanography
	PLUS 3 level 5 electives	Environmental Law	PLUS 5 electives
		PLUS 4 electives	OR 3 electives & Research Project
Microbiology	Microbiology	Environmental Microbiology	Advanced Food Microbiology
	Biological Chemistry	Food Microbiology	Biotechnology
	Ecology & Evolution	Biochemistry	Molecular Genetics
	Principles of Chemistry	Medical Microbiology I	PLUS 5 electives
	PLUS 2 level 5 electives	Industrial Microbiology	OR 3 electives & Research Project
		Genetics	
		PLUS 2 electives	

Elective papers

In all majors you can complete elective papers as part of your study. Some papers have prerequisites.

Level 5 (Year 1) elective papers

- Biodiversity
- Biological Chemistry
- Biological Sampling & Interpretation
- Biophysics
- Ecology & Evolution
- Introduction to Epidemiology
- Food Science
- Principles of Chemistry
- Microbiology
- Physical & Human Geography
- Plants & Animals

Level 6

- Analytical Chemistry
- Aquaculture
- Biochemistry
- Biogeography
- Communicable Diseases
- Conservation Planning
- Environmental Health
- Environmental Law
- Environmental Microbiology
- Environmental Risk Assessment
- Fish & Aquatic Plants
- Food Chemistry
- Food Microbiology
- Food Technology
- Freshwater Ecology
- Genetics
- Geographical Information Systems
- Industrial Microbiology
- Marine Invertebrates
- Medical Microbiology I
- Organic Chemistry
- Physical Chemistry
- Planning for Environmental Sustainability
- Process Engineering
- Research Techniques
- Terrestrial Ecology

Level 7

- Advanced Analytical Chemistry
- Advanced Food Chemistry
- Advanced Food Microbiology
- Advanced Organic Chemistry
- Animal Behaviour & Ecology
- Applied Conservation
- Biomedical Research
- Biomedical Technology
- Biotechnology
- Ecosystem Management
- Environmental Chemistry
- Food Industry Legislation
- Food Product Development
- Food Safety Systems
- Geospatial Analysis
- Health Protection
- Marine Ecology
- Molecular Genetics
- Natural Compounds
- Natural Products
- Oceanography
- Pharmacology for Professional Practice
- Plant Ecology
- Remote Sensing
- Research Project (30 pts)
- Sensory Evaluation
- Socio-ecological Systems
- Pacific Islands Coastal Ecology

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 & Communication
- Health & Environment
- Plants & Animals
- Ecology & Evolution
- Biological Sampling & Interpretation
- Physical & Human Geography

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:

- Environmental Law
- Research Techniques
- Geographic Information Systems
- Biogeography
- Freshwater Ecology [2]
- Terrestrial Ecology [2]
- Fish & Aquatic Plants [2]
- Marine Invertebrates [2]
- Conservation Planning
- Ecosystem Management
- Socio-ecological Systems

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 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 fee-only scholarships for the first year of the Bachelor of Science, one for every major. Some scholarships cover the full three years of your study, co-funded by external institutions like the Department of Conservation. 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 **www.aut.ac.nz/scholarships**

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

1. After completing a graduate diploma in education.
2. You need to complete two of these four papers.
3. We encourage you to apply as soon as applications are open (late May 2017). 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 **www.aut.ac.nz/sciences**

Ticiana Fettermann de Oliveira

Master of Science student

"I've studied marine wildlife since 2005, in both the Atlantic and Pacific Ocean. I've worked with research teams from Brazil, New Zealand and the Cook Islands, aiming to protect the ocean and the species that live in this environment.

"A few years ago, I became interested in geographic information systems and was impressed by the work of AUT Associate Professor Barbara Breen. She is an amazing human being who is dedicated to protecting the environment and uses the latest technology for ecological studies. I felt a connection with her and the university straightaway.

"My main research interest is the behaviour interactions of bottlenose dolphins, an endangered species in New Zealand. I'm investigating the use of small unmanned aerial vehicle (UAV) technology to safely collect behavioural data on these dolphins without harming them. My aim is to use this research to help develop best practices and guidelines for the use of drones in studies on marine mammals.

"I'm passionate about the ocean and conservation. I feel totally connected to my research – I enjoy every moment and every single field trip. My aim is to make sure I'm contributing as much as I can to protect the wildlife and their habitat. While doing my research I was also fortunate to film Bryde's whales feeding. This footage was a world-first and attracted attention from media all over the world."

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:

- Knowledge, Enquiry & Communication
- Health & Environment
- Principles of Chemistry
- Biological Chemistry
- Human Anatomy & Physiology I
- Microbiology
- Biological Sampling & Interpretation

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 & Physiology II
- Biochemistry
- Methods of Research & Enquiry
- Genetics
- 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 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 fee-only scholarships for the first year of the Bachelor of Science, one for every major. Some scholarships cover the full three years of your study, co-funded by external institutions like the Department of Conservation. 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 **www.aut.ac.nz/scholarships**

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

1. We encourage you to apply as soon as applications are open (late May 2017). 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 **www.aut.ac.nz/sciences**

Seyedehsara (Sara) Masoomi Dezfooli
Doctor of Philosophy candidate

"There's high demand for multidisciplinary research that responds to global environmental problems. One of the main problems in aquaculture around the world is disease outbreaks, but applying chemical agents and veterinary medicines to control those diseases endangers the environment. My aim is to develop biodegradable micro capsules that can deliver nutrients, vaccines, probiotics and other bioactive agents to farmed aquatic animals.

"This is multidisciplinary research that involves biomedical science, microbiology, drug delivery, nanotechnology and marine biology. It's a challenging project, but it's exciting and I want to make a positive impact on society and the New Zealand economy.

"What is fascinating about AUT is the constant interaction between the university and different New Zealand industries. Having scientists and researchers who are linked to businesses and industries is one of AUT's greatest strength. AUT has the most wonderful professors, advisors and mentors who lead you towards the right path. You'll build your confidence by doing research and problem solving, while being supported by people who believe in you.

"I've had several opportunities to present my research nationally and internationally. I've also been involved in different academic activities, including lecturing, curriculum development, journal reviewing and book editing. This has been invaluable experience that I could only have at AUT. Choosing AUT was the best decision I've made."

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 & Communication
- Health & Environment
- Principles of Chemistry
- Biological Chemistry
- Biophysics

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:

- Analytical Chemistry
- Physical Chemistry
- Biochemistry
- Organic Chemistry
- Environmental Chemistry
- Natural Products
- Advanced Analytical Chemistry
- Advanced Organic Chemistry
- Advanced 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.

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]

Workplace experience

In your final year you can enrol in the Research Project paper (30 points) if you have 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 fee-only scholarships for the first year of the Bachelor of Science, one for every major. Some scholarships cover the full three years of your study, co-funded by external institutions like the Department of Conservation. 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 **www.aut.ac.nz/scholarships**

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

1. After completing a graduate diploma in teaching.
2. We encourage you to apply as soon as applications are open (late May 2017). 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 **www.aut.ac.nz/sciences**

Zahra Moiyadi
Laboratory Technician – Organic Chemistry, Watercare
Bachelor of Science (Honours)
Bachelor of Science in Chemistry

"What I love about chemistry is that there are infinite structures and variety in the behaviour of the particles, elements, molecules and compounds that make up this world.

"In my role at Watercare, I'm responsible for analysing samples by using liquid and gas chromatographic techniques. I enjoy using different analytic equipment to perform quantitative analyses. I constantly draw on what I learned at AUT. The dissertation project for my AUT Bachelor of Science (Honours) required the use of these techniques, which are the primary instruments used for the lab analysis at Watercare.

"Compared to other universities, AUT's classes are more practice-based, which is very important in science. The AUT degree includes a lot of time in hands-on labs, which gives students the opportunity to really understand the various techniques and instruments used for scientific analysis. In the final year of my AUT Bachelor of Science degree, I also had the opportunity to undertake independent research. That is an opportunity not many universities offer undergraduate students.

"The classes are smaller and more interactive, so there is better communication between lecturers and students. It makes the transition from high school to university a lot easier. I got to know everyone in my classes, and we all assisted each other to get the best out of the opportunity."

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 & Communication
- Health & Environment
- Plants & Animals
- Ecology & Evolution
- Biological Sampling & Interpretation

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 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

We offer competitive fee-only scholarships for the first year of the Bachelor of Science, one for every major. Some scholarships cover the full three years of your study, co-funded by external institutions like the Department of Conservation. 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 **www.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 (late May 2017). 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 **www.aut.ac.nz/sciences**

Hamish Allen

Park Ranger, Auckland Council
Master of Science student
Bachelor of Science in Environmental Sciences and Marine Biology

"Studying environmental sciences is a great way to turn your passion for the environment into a rewarding career. I chose AUT because it's known for its focus on fieldwork and practical experience. This has really helped get me ready for a career in environmental sciences. The lecturers were really engaging and passionate. I especially loved the practical components of the papers, like getting out on the water or the forest with lecturers who are experts in their field. AUT staff have been very supportive, from the start of my Bachelor of Science to my postgraduate studies now."

Employer comment

"Hamish has been working for Auckland Council in a number of roles as a park ranger. He has great people skills that allow him to actively engage with park visitors both in a regulatory capacity enforcing park rules, but also educating and engaging them in the parks. I've been present when Hamish has been passing on his knowledge of the marine environment to park visitors and he has them totally entranced. Hamish's combination of work experience and theoretical study is giving him a strong foundation for the career direction he is looking to take."

Wayne Carlson, Senior Ranger Recreation/Education, Auckland Council

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 & Communication
- Health & Environment
- Principles of Chemistry
- Food Science
- Biological Chemistry
- Microbiology
- Biological Sampling & Interpretation

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
- Quality Assurance
- 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 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 fee-only scholarships for the first year of the Bachelor of Science, one for every major. Some scholarships cover the full three years of your study, co-funded by external institutions like the Department of Conservation. 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 **www.aut.ac.nz/scholarships**

Industry comment

"New Zealand leads the globe as a quality food brand. Food exports from New Zealand are currently valued at $17.5 billion and projected to double by 2025. The recent New Zealand Government's Capability Report highlights the opportunity for food safety as 'high profile and clearly articulated career pathway'. This creates opportunities for graduates at regulatory agencies at a local (council) as well as a national level (audit companies or the Ministry for Primary Industries). The projected growth also creates opportunities in global markets where similar trends are projected, as a result of the growth in purchasing power and better informed consumers who are demanding higher food safety and quality standards."

Keith Michael, Food Safe Ltd

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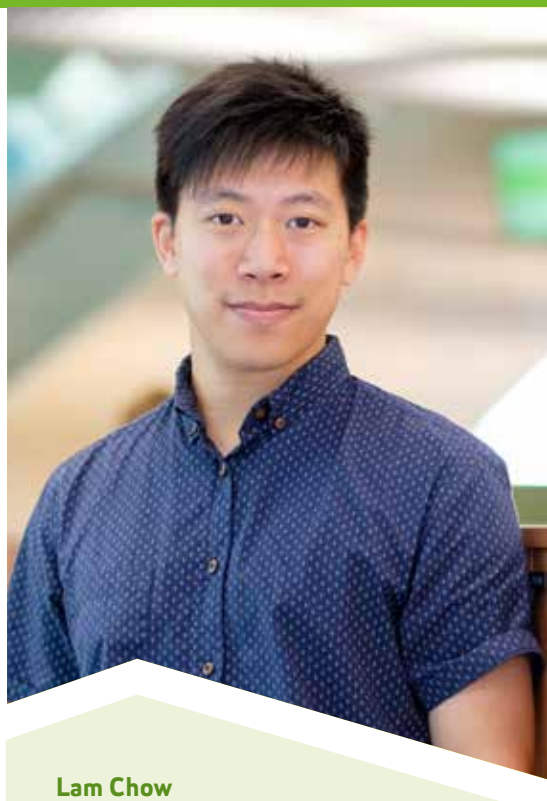

Lam Chow
Assistant Food Technologist, iMonitor
Bachelor of Science in Food Science

"The company is developing a solution for real-time temperature monitoring within the food distribution cold chain. It's exciting to be working in a company that's pioneering a technology solution to improve food safety during food storage and distribution.

"My job involves developing alarm profiles specific to various products, as well as liaising with food retailers to help them improve their businesses. I'm also involved with managing the lab, along with the procurement of lab equipment. I'm constantly drawing on the skills I developed at AUT to contribute towards safer food and less food wastage.

"I always knew I would study a Bachelor of Science, and after researching my options I found that food science strongly resonated with my interests. I chose AUT because it has strong links with the New Zealand food industry. During my studies at AUT, I discovered my passion for food microbiology and, in turn, food safety.

"In my third year, I had the opportunity to complete an undergraduate research project, supervised by Dr Brent Seale. My project involved investigating whether a recently developed surface sanitiser was effective against a specific food pathogen, known to be problematic within food processing environments. Through this research project I gained invaluable experience in experimental design and was able to further develop my independent research skills."

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 & Communication
- Health & Environment
- Principles of Chemistry
- Food Science
- Biological Chemistry
- Biophysics
- Microbiology
- Biological Sampling & 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
- 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 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 (late May 2017). 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.

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Svetlana (Lana) Philcox
Business Manager, Kohu Road Ltd
Bachelor of Science in Food Science

"I love my job! It feels amazing to see your creation in the supermarket and get great feedback from the consumers. My job involves applying creative critical thinking skills to solve technical problems and drive innovations. I'm constantly drawing on my knowledge of food chemistry, food composition and sensory evaluation to help create new products consumers want to buy. I love the versatility of my role. One day I might be in the kitchen creating new products, the next day meeting potential suppliers and looking for new ingredients or packaging solutions, or staying in the office doing administrative tasks."

Employer comment

"Svetlana (Lana) was a perfect candidate for our business due to her educational background, and her strong communication and creative thinking skills. We had been trying to fill this position for a long time, but were struggling due to the shortage of qualified food technologists in New Zealand. We were looking for someone with an understanding of food science and new product development; knowledge of hazard analysis and critical control points (HACCP), food safety, microbiology and good manufacturing practices (GMP), as well as creative thinking, innovation and a proactive approach. AUT's food science degree provides skilled employees like Lana for the highly demanding New Zealand food industry."

Greg Hall, Managing Director/ Founder, Kohu Road Ltd

KEY FEATURES:

- High demand for geospatial science graduates
- Skills to 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 like Google Earth

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 emphasizes 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 & Communication
- Health & Environment
- Plants & Animals
- Ecology & Evolution
- Biological Sampling & Interpretation
- Physical & Human Geography

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 a B grade average in 60 points at level 6. This may involve working on an industry-related project related to your major.

Scholarships

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

Sally Be

Senior Geospatial Analyst, Stormwater Team, Auckland Council
Postgraduate Diploma in Geographic Information Science

"GIS is essential for a number of disciplines, including conservation, health, marketing and urban planning. Many organisations in the public and private sectors need to make sense of information that is, for the most part, inherently spatial. I believe having expertise in GIS is beneficial in whatever career path you choose. In my role at Auckland Council, my main tasks include stormwater asset data maintenance and providing geospatial support for the wider team, including mapping projects, data analysis and using web-based and cloud enabled GIS to capture, store, visualise, analyse and interrogate data."

Employer comment

"We use GIS as a tool to help optimise and improve the way we manage our infrastructure. As such, we require people who not only know how to practically use GIS applications, but who are also are willing to learn how the stormwater business operates and can apply what they know about GIS to help improve it. Sally fits these criteria fantastically – she has an excellent base knowledge and a willingness to expand her knowledge to fit the business requirements. AUT's qualification gives us assurance that she can adequately perform the skills we require for the role."

Samuel Clive, Principal - Data Analytics, Auckland Council

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 & Communication
- Health & Environment
- Principles of Chemistry
- Plants & Animals
- Microbiology
- Biological Sampling & Interpretation
- Epidemiology

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
- Food Industry Legislation
- 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 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 fee-only scholarships for the first year of the Bachelor of Science, one for every major. Some scholarships cover the full three years of your study, co-funded by external institutions like the Department of Conservation. 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 **www.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 (late May 2017). 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 **www.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 & Communication
- Health & Environment
- Plants & Animals
- Ecology & Evolution
- Biological Sampling & Interpretation

Year 2 & 3

Papers include:

- Fish & Aquatic Plants
- Marine Invertebrates
- Research Techniques
- Environmental Law
- Marine Ecology
- Ecosystem Management
- 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 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 Ltd
- OceaNZ Blue

Scholarships

We offer competitive fee-only scholarships for the first year of the Bachelor of Science, one for every major. Some scholarships cover the full three years of your study, co-funded by external institutions like the Department of Conservation. 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 **www.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 (late May 2017). 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 **www.aut.ac.nz/sciences**

Antony Vavia

Bachelor of Science (Honours) student
Bachelor of Science in Marine Biology

"I've wanted to be a marine biologist since I was in intermediate school. I'm passionate about working in the ocean and I want a career that involves travelling and exploring different parts of the ocean to see a new world most others haven't seen. I'd love to take my knowledge and skills into the Pacific and make a real difference there. Not many Pacific people enter the science field, but with our homelands affected by climate change and other issues, marine biology expertise is becoming increasingly important.

"I've enjoyed the whole adventure of being at university. This includes learning new things and also experiencing what it's like to be a marine biologist. I love being able to share all these awesome experiences with the new friends I've made along the way. I would definitely recommend AUT's Bachelor of Science.

"After completing my undergraduate degree last year, I'm now enrolled in a Bachelor of Science (Honours). I knew that I wanted to continue my studies, so I'm back again doing my Bachelor of Science (Honours) and making progress towards becoming a marine biologist. This year I'll be changing things up a bit by including learning about geographic information systems, which will help me analyse marine coastal environments by using drone footage. I'll be learning to apply these new skills to help improve potential aquaculture practices."

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, and 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 & Communication
- Health & Environment
- Microbiology
- Biological Chemistry
- Ecology & Evolution
- Principles of Chemistry

Year 2 & 3

Papers include:

- Environmental Microbiology
- Food Microbiology
- Biochemistry
- Medical Microbiology I
- Industrial Microbiology
- 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 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

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

Robins Jacob
Technician, Auckland Forensic Service Centre, ESR
Bachelor of Science in Microbiology

"At AUT you don't just learn in lecture theatres, but your study also includes smaller group sessions. It's a more in-depth learning environment, with better interaction with academics and the other students. I think you learn twice as much in smaller groups. I also immensely enjoyed working in smaller groups in the lab, and participating in all the research components. The lecturers are so approachable and down to earth, and they always provide the latest information and real-world applications. They often went above and beyond to ensure my success. My time at AUT gave me a huge boost of confidence, and the courage to contribute in my highly demanding job."

Employer comment

"Robins was employed at ESR because he had good science knowledge that could be applied across the variety of casework and research activities the Service Centre is involved in. We needed someone with skills across chemistry and biology, and the ability to apply their knowledge in practical situations. We wanted someone who would take a hands-on approach and be proactive to completing their tasks, while working collaboratively with a team of experienced scientists."

Dion Sheppard, Team Leader/ Science Leader – Auckland Service Centre, ESR

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:	26 Feb & 16 July 2018

King Ting Yik
Medical Laboratory Scientist, New Zealand Blood Service
Bachelor of Medical Laboratory Science

"What I enjoy most about my work is the satisfaction when you find a donor that matches the patient who is really in need of a transplant. My responsibilities include DNA extractions, platelet typing and human leukocyte antigen typing, which are essential for donor matching. I'm constantly applying the practical molecular diagnostics skills I developed at AUT in my work now. I had heard from others who went to AUT that the programmes include a lot of practical work in addition to the theory. I also liked that AUT could provide me with workplace experience in my final year, which I knew would put me ahead of a lot of people."

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

Required school subjects

Biology, Chemistry, Statistics

Don't meet the entry requirements?

Consider starting with our Certificate in Applied 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 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 (late May 2017). 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 **www.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

YEAR	SEMESTER 1	SEMESTER 2
1 — 120 points	Knowledge, Enquiry & Communication	Biological Chemistry
	Human Anatomy & Physiology I	Human Anatomy & Physiology II
	Microbiology	Biological Sampling & Interpretation
	Principles of Chemistry	Histology & Cytology
2 — 120 points	Biochemistry	Clinical Chemistry I
	Medical Microbiology I	Haematology I
	Immunology & Virology	Transfusion Science I
	Genetics	Molecular Genetics
3 — 120 points	Pathology I	Pathology II
	Professional Practice & Ethics (Semester 1 or Semester 2)	
	Methods of Research & 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

Selection criteria

Preference will be given to applicants with at least 12 credits at level 2, and one subject from Biology, Chemistry, Earth and Space Science, Physics, Science, and 12 credits at level 2 in one or more subjects from Classical Studies, Drama, English, Geography, Health Education, History, History of Art, Media Studies, Social Studies, Te Reo Māori, Te Reo Rangatira, Biology, Chemistry, Earth and Space Science, Physics, Science, Calculus, Mathematics or Statistics

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
- Principles of Chemistry
- Introduction to Academic Writing
- Plants and Animals

Career opportunities

This certificate prepares you for undergraduate study in 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 (late May 2017). 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.

QUICK FACTS

Level:	4
Points:	120
Duration:	1 year F/T
Campus:	City
Starts:	26 Feb & 16 July 2018

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

QUICK FACTS

Level:	5
Points:	120
Duration:	**Standard diploma:** 1 year F/T, P/T available **Anaesthetic Technology:** 3 years P/T **Pre-Chiropractic:** 1 year F/T
Campus:	City
Starts:	26 Feb & 16 July 2018

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.

Anaesthetic Technology

→ Diploma papers provide the theory supporting the practice of anaesthetic technology, during three years of clinical training based in the hospital.

A student must have a position as a trainee in a recognised training hospital to undertake this qualification which leads to technician registration.

Pre-Chiropractic

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

Diploma in Applied Science

DipAppSc | AK3750

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

There are three common pathways:

- Standard diploma
- Anaesthetic Technology
- Pre-Chiropractic

Entry requirements

Minimum entry requirements

- **NCEA:** 48 level 2 credits including eight level 2 credits in any one subject from Classical Studies, Drama, English, Geography, Health Education, History, History of Art, Media Studies, Social Studies or Business Studies, Economics, Physical Education, Te Reo Māori, Te Reo Rangatira
- **CIE:** 60 points on the UCAS Tariff, including any one subject similar to the NCEA subjects listed above

Selection criteria

Anaesthetic Technology: Letter of confirmation from Training Hospital

Pre-Chiropractic: If intending to continue into chiropractic study students need a Letter of Intention to NZCC following an interview by the New Zealand College of Chiropractic

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

Anaesthetic Technology

This three-year diploma equips trainee anaesthetic technicians[1] with the skills to become a registered anaesthetic technician.

In Year 1, you study Anaesthesia I (an introduction to anaesthesia), Human Anatomy and Physiology, and Anaesthetic Technology I.

In Year 2, you study Anaesthesia II (a paper on special topics related to the role of the anaesthetic technician) and Biophysics.

In Year 3, you study Anaesthesia III (anaesthetic equipment, monitoring and fluid administration), Anaesthesia IV, and Anaesthetic Technology II [2].

To find out which hospitals are recognised training facilities, contact:

The Registrar, NZATS
PO Box 10691
Wellington South
www.nzats.co.nz

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:

- Principles of Chemistry
- Biological 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
(09) 526 6789

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

1. All people working as trainee anaesthetic technicians or nurses must be registered as trainees and employed in a hospital that is a Medical Sciences Council of New Zealand recognised training facility.
2. Some papers are delivered as block courses and attendance on campus may be required.
3. We encourage you to apply as soon as applications are open (late May 2017). 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 **www.aut.ac.nz/sciences**

Kevin Kantono

Product Development Technologist, Sanford Ltd
Doctor of Philosophy
Bachelor of Science (Honours) (First Class)
Bachelor of Science in Food Science
Diploma in Applied Science

"I had the opportunity to talk to one of the executives from Orang Tua, a widely known food company in Indonesia. He mentioned that we always need food in our lives; we need it every day and that won't change. In contrast, we only need medicine when we're sick. This philosophy convinced me to jump into studying food science.

"I now use my knowledge of food science to help Sanford Ltd develop new seafood products. Sanford is New Zealand's largest integrated fishing and aquaculture business, and I'm involved in the research and development of new products, and assisting departments when it comes to product development and implementation. Sanford is an innovative and fast-moving company, and I'm hoping to use my knowledge to make an exceptional breakthrough here.

"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.

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].

Graduate Diploma in Science
QUICK FACTS

Level:	7
Points:	120
Duration:	1 year F/T, 2 years P/T
Campus:	City
Starts:	26 Feb & 16 July 2018

Graduate Certificate in Science
QUICK FACTS

Level:	7
Points:	60
Duration:	½ year F/T, 1 year P/T
Campus:	City
Starts:	26 Feb & 16 July 2018

1. We encourage you to apply as soon as applications are open (late May 2017). 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 **www.aut.ac.nz/sciences**

Overview of our postgraduate qualifications

Bachelor of Science (Honours)

The 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.

Postgraduate Certificate in Science and Postgraduate Diploma in Science

These qualifications equip students with advanced knowledge in sciences, 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 seven specialisations: Applied Conservation, Biomedical Science, Chemistry, Environmental Science, Food Science, Microbiology and 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 seven specialisations: Applied Conservation, Biomedical Science, Chemistry, Environmental Science, Food Science, Microbiology and 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.

Postgraduate Diploma in Geographic Information Science

The Postgraduate Diploma in Geographic Information Science offers an interdisciplinary approach to geographic information science. It takes one year of full-time study or two years part-time, and can lead into the Master of Geographic Information Science.

Master of Geographic Information Science

The Master of Geographic Information Science provides an interdisciplinary approach to geographic information science, and includes taught papers and a supervised research thesis. It takes two years full-time or four years part-time. Graduates will have the ability to carry out original research and manage applied GIS projects.

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

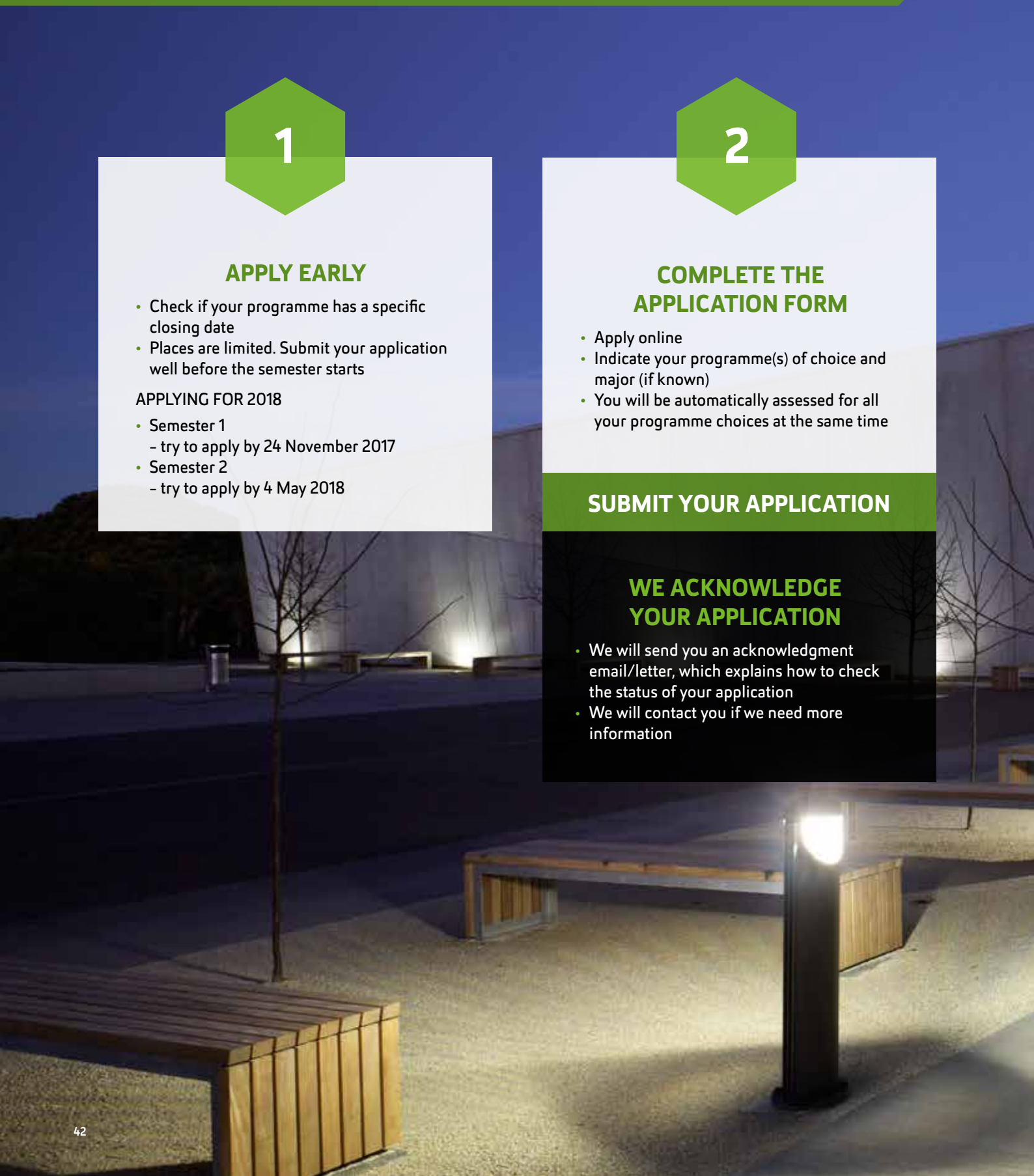
The Doctor of Philosophy (PhD) is a thesis-based research degree that leads to advanced academic and theoretical knowledge in a specialist area. The programme enables you to make an original contribution to knowledge or understanding in your field. You work closely with a supervisor to prepare a thesis,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

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

How to apply

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

International students should visit www.aut.ac.nz/international



1

APPLY EARLY

- Check if your programme has a specific closing date
- Places are limited. Submit your application well before the semester starts

APPLYING FOR 2018

- Semester 1
  – try to apply by 24 November 2017
- Semester 2
  – try to apply by 4 May 2018

2

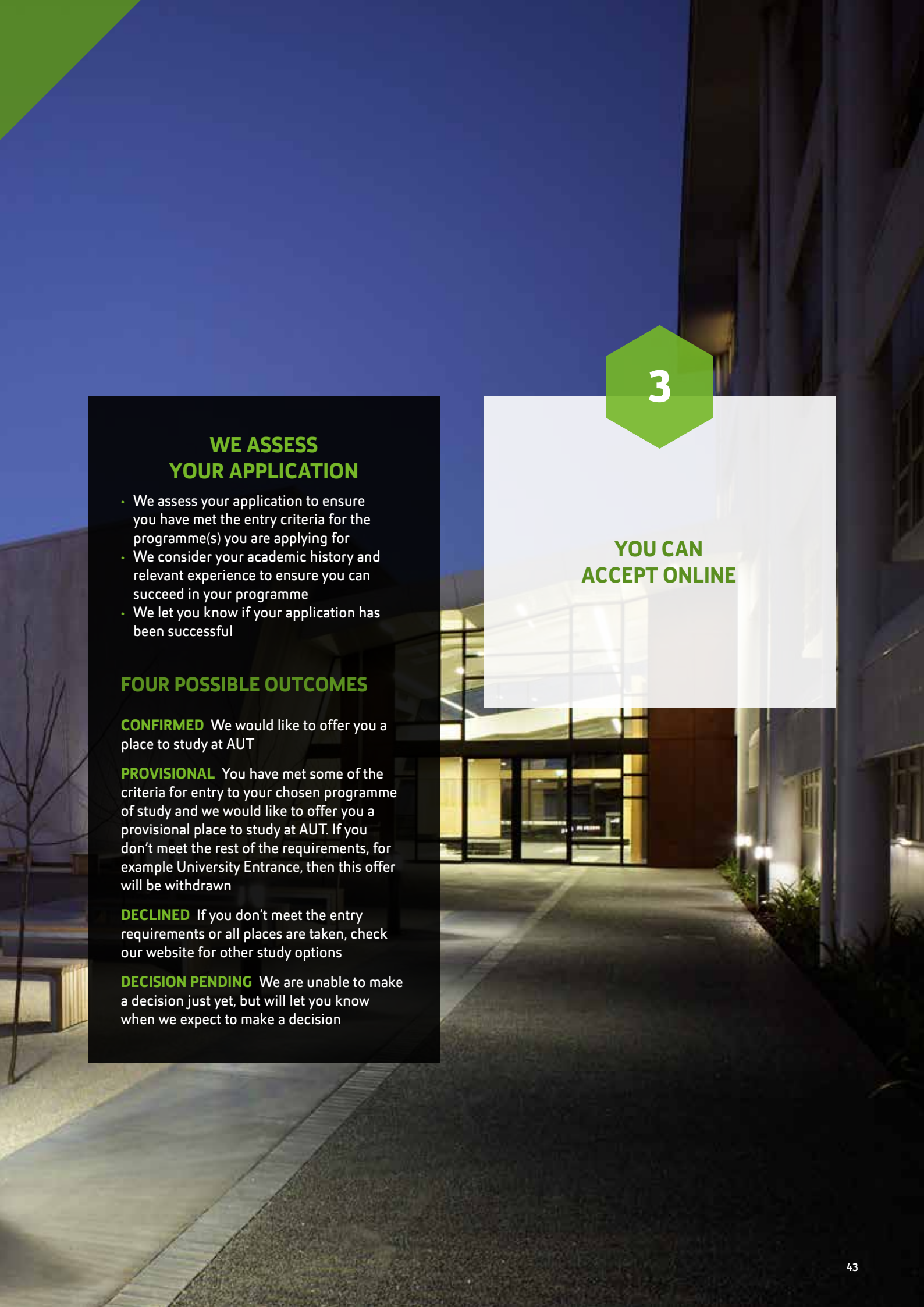
COMPLETE THE APPLICATION FORM

- Apply online
- Indicate your programme(s) of choice and major (if known)
- You will be automatically assessed for all your programme choices at the same time

SUBMIT YOUR APPLICATION

WE ACKNOWLEDGE YOUR APPLICATION

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



3

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

FOUR 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, for example University Entrance, then this offer will be withdrawn

DECLINED If you don't meet the entry requirements or all places are taken, check our website for other study options

DECISION PENDING We are unable to make a decision just yet, but will let you know when we expect to make a decision

YOU CAN ACCEPT ONLINE

University admission to AUT bachelor's degrees

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 all admission categories and specific programme requirements refer to the AUT Calendar or visit **www.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)[1] and International Baccalaureate Diploma Programme (IB) if taught in a New Zealand secondary school
- Discretionary Entrance
- Special Admission

1. Domestic students who study CIE in another country may be eligible for this admission depending on subjects covered and levels attained with the qualification. As requirements vary such students should seek advice from AUT.

Common University Entrance requirements

STANDARD	NCEA	CIE[1]	IB[4]
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[2] 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. Different regulations if CIE is taken outside of NZ or UK. See the AUT Calendar which is available online at **www.aut.ac.nz/calendar**
2. UCAS (Universities and Colleges Admissions Services for the UK) Tariff = system which converts AS and A level grades into points.
3. IGCSE = International General Certificate of Secondary Education.
4. New Zealand residents who have taken IB but have not been awarded the Diploma may apply for discretionary entrance.

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

NCEA approved subjects

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

AUT language rich subject list

Classical Studies, Drama, English, Geography, Health Education, History, History of Art, Media Studies, Social Studies, Te Reo Māori or 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 studies certificates offered at AUT. Please visit **www.aut.ac.nz/apply**

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 **www.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
- 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 **www.aut.ac.nz/calendar**

Special Admission

If you are over 20 years of age you can apply through Special Admission for degree-level study without a University Entrance qualification, if you are a New Zealand citizen or resident. You must be 20 years of age on or before the first day of the semester in which the programme commences. Your ability to succeed in your chosen programme will be taken into consideration.

English language requirements

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 cannot be substituted.

Please refer to the English language requirements in the "General Academic Regulations" section of the AUT Calendar or visit **www.aut.ac.nz/calendar**

International students

Contact the International Centre 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.

Tel: +64 9 921 9099

Email: **aut.university@internationalstudent.info**

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.

Fees

To give you an idea of approximate costs, the 2017 tuition fees for domestic students are shown below (based on full-time study and completing 120 points a year). The 2018 tuition fees will be advertised on **www.aut.ac.nz/fees** as soon as they have been set.

Undergraduate qualifications

Fee (per year)	**Approximately $6,324.00**[1] **(GST inc)**

1. Part-time students pay a proportion of the fee based on the number of academic points they are studying.

If you are an international student, please visit **www.aut.ac.nz/fees** for fees and information.

Other fees you may have to pay:

- 2017 Compulsory Student Services Fee – $641.80 for 120 points or $5.12 per academic point (GST incl)
- 2017 Building Levy – $68.20 for 120 points or $0.57 per academic point (GST incl)
- 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 **(09) 921 9779** or the AUT Student Hub on **0800 AUT UNI (0800 288 864)**.

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 **(09) 921 9837** or visit **www.aut.ac.nz/scholarships**

Student loans and allowances

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 **www.studylink.govt.nz**

Help with planning and budgeting

We know that studying can be hard on your finances, and can help students manage their money and stay within budget. We also assist students in financial hardship through food and transport grants, and provide assistance with student loans and allowances.

For more information visit **www.aut.ac.nz/student_services/financial**

StudyLink Sussed website

A useful financial resource is the StudyLink Sussed website. The website has handy tools, tips and information to help you plan and understand the costs you will have while studying.

Visit **www.studylink.govt.nz**

How to pay your fees

ONLINE	You can pay by credit card or by internet banking online at **www.aut.ac.nz.** Your login details will be required. OR Bank transfer: You can make a direct fee payment into AUT's bank account. Visit **www.aut.ac.nz/payment-options**
POST	Pay by cheque, credit or debit card by completing the payment slip on your statement/tax invoice, detach and post to: Fee Payment, AUT, Private Bag 92006, Auckland 1142
FAX	Pay by credit or debit card by completing the payment slip on your statement/tax invoice and fax to (09) 921 9985
IN PERSON	City Campus: AUT Student Hub, WA building North Campus: AUT Student Hub, AS building South Campus: Campus Reception, MB building
STUDENT LOAN (STUDYLINK)	StudyLink will pay your fees directly to AUT. See your student loan documentation for more information.

Find out more

Visit our website

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

Call or email us

To speak to one of our friendly advisors call the AUT Student Hub on **0800 AUT UNI** (0800 288 864). If you need help with your application to study at AUT, want more information or would like to order a brochure – we're here to help.

You can also email any questions you have to **studenthub@aut.ac.nz**

Secondary schools

If you are a secondary school teacher, career advisor or student, our Future Students Team can help you with any questions you may have. Contact the team on (09) 921 9239 or email **futurestudents@aut.ac.nz**

AUT Open Day

Our Open Day on Saturday 2 September 2017 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 **www.aut.ac.nz/live**

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

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

Campus tours

If you want to check out the campus and facilities, contact us and we will arrange a campus tour for you and your family. Call **0800 AUT UNI** (0800 288 864) for more information.

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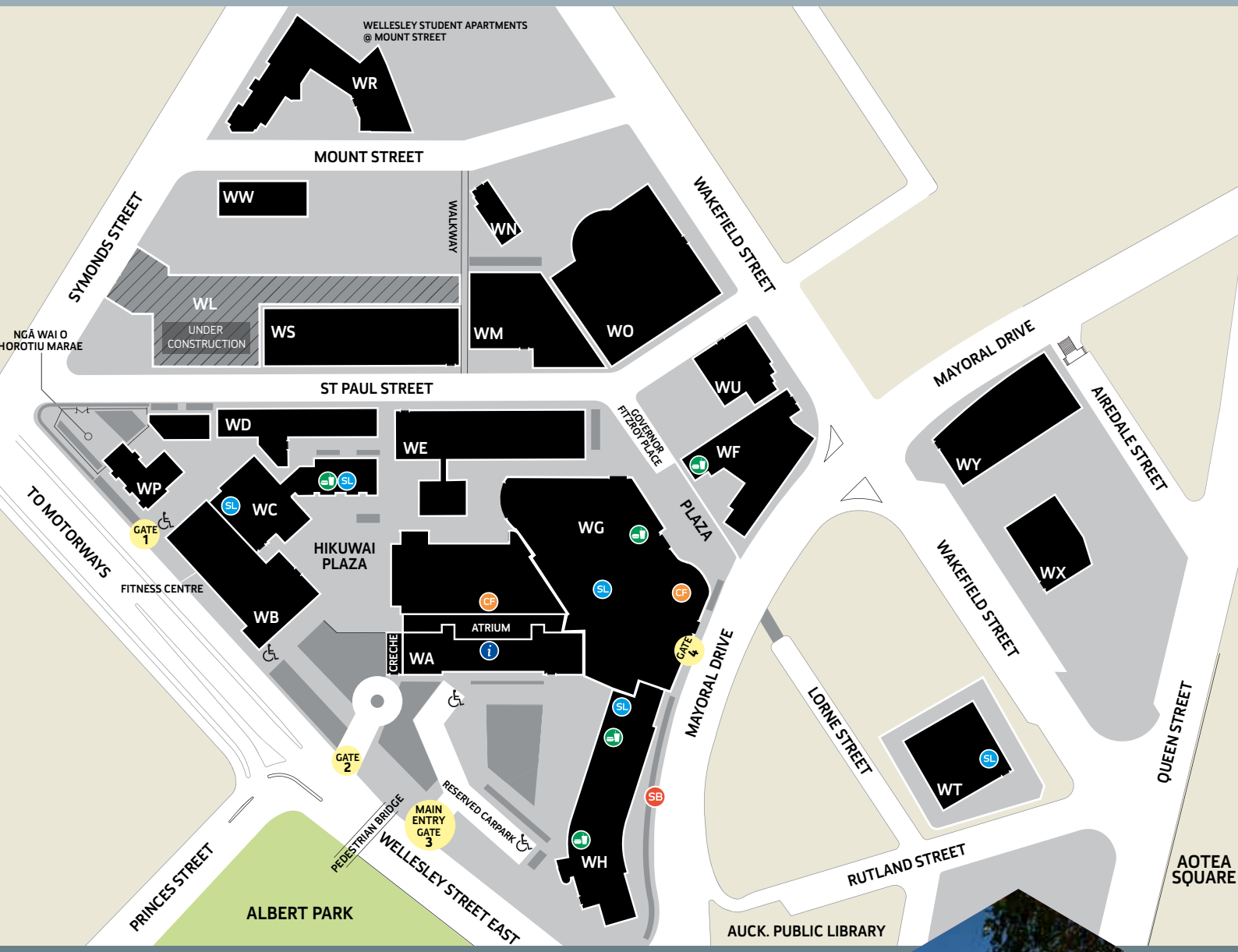
Campus maps

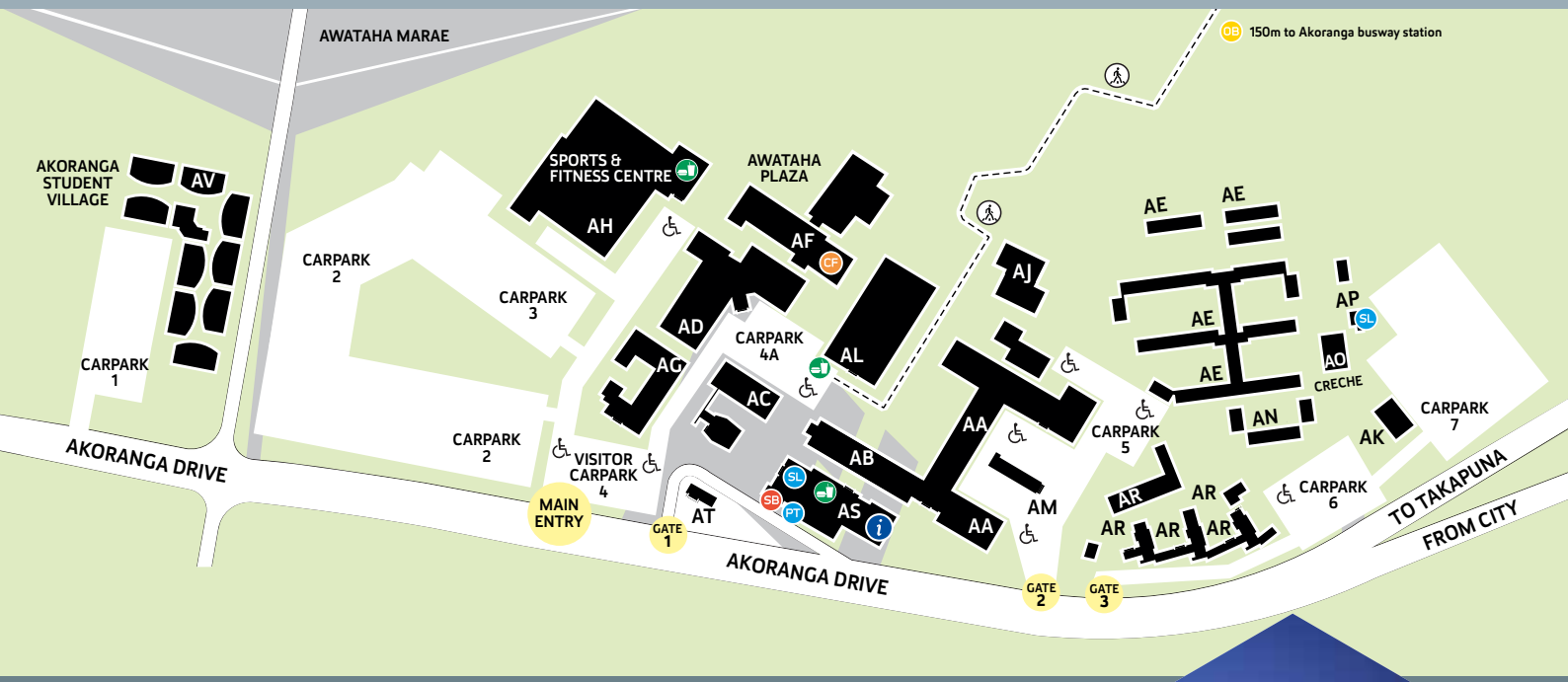


City Campus

55 Wellesley Street East
Auckland Central

Key

- AUT Student Hub
- Café
- Conference facility
- Intercampus shuttle bus stop
- Mobility parks
- Student lounge



North Campus

90 Akoranga Drive
Northcote, Auckland

Key

- AUT Student Hub
- Café
- Conference facility
- Intercampus shuttle bus stop
- Mobility parks
- Student lounge

SCIENCE

UNDERGRADUATE PROGRAMME GUIDE 2018

0800 AUT UNI (0800 288 864)
Auckland University of Technology
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Auckland 1142
studenthub@aut.ac.nz
www.aut.ac.nz

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:

@autuni #autuni

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