SCIENCE UNDERGRADUATE PROGRAMME GUIDE 2020





Welcome to Science

Welcome to AUT



Nau mai, haere mai. Welcome to your future and welcome to the School of Science in the Faculty of Health and Environmental Sciences.

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 professors and lecturers are passionate and committed to engaging with you as an AUT student. They have international research reputations in their respective fields. We have designed our programmes to ensure that you will have the skills to be in demand by employers once you graduate.

We provide graduates with the skills necessary to gain rewarding employment, and contribute to scientific innovation, and excellence and social 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 Max Abbott

CNZM, BA, BSc *Well*, MA, PhD *Cant*, DipClinPsych, MNZCC Dean, Faculty of Health and Environmental Sciences

and Pro Vice-Chancellor, North Campus

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

Image 1 on page 5 by Evan Brown.

Cover:

#1 global research impact: Ranked #1 in New Zealand for the number of times our research is cited globally (Times Higher Education World University Rankings 2019).

5 out of 5: QS Stars University Ranking.

Top 1.2%: Ranked in the world's top 301-350 universities (Times Higher Education World University Rankings 2019).

Disclaimer: Although every reasonable effort is made to ensure accuracy, the information in this document is provided as a general guide only for students and is subject to change. All students enrolling at AUT should consult its official document, the AUT Calendar, which is available online at www.aut.ac.nz/calendar, to ensure that they are aware of, and comply with, all regulations, requirements and policies.

International students should visit www.aut.ac.nz/international for entry requirements and detailed application information.

The information contained in this programme guide was correct at the time of print, December 2018.

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

Business School Te Kura Kaipakihi

Law School Te Kura Ture

School of Economics Matauranga Õhanga

FACULTY OF CULTURE AND SOCIETY TE ARA KETE ARONUI

School of Education Te Kura Mātauranga

School of Hospitality and Tourism Te Kura Taurimatanga me te Mahi Tāpoi

School of Language and Culture Te Kura Reo me te Ahurea

School of Social Sciences and Public Policy Te Kura Pūtaiao ā-iwi me ngā Kaupapa Tūmatanui

FACULTY OF DESIGN AND CREATIVE TECHNOLOGIES

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

Creative Technologies Marautanga Matatini

TE ARA POUTAMA FACULTY OF MÃORI AND INDIGENOUS DEVELOPMENT

FACULTY OF HEALTH AND ENVIRONMENTAL SCIENCES TE ARA HAUORA A PÙTAIAO

School of Clinical Sciences Te Kura Mātai Haumanu

School of Interprofessional Health Studies Te Kura Pākeho Ngaiotanga o Ngā Marau Akoranga Hauora

School of Public Health and Psychosocial Studies Te Kura Hauora Tūmatanui

School of Science Te Kura Pūtaiao

School of Sport and Recreation Te Kura Hākinakina

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.

WHY STUDY SCIENCE?



Study science majors not available anywhere else in NZ



Nationally and internationally recognised lecturers



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



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

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 the Times Higher Education World University Rankings 2019 place AUT in the top 1.2% (301–350) 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 provide you with invaluable networking opportunities and ensure that your programme is relevant to your career, making it easy to move from your studies to the working world. 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

At AUT, you work with people from different disciplines – students, staff or industry contacts. Through our mentor programme every student also meets regularly with an academic in small groups of five to six students throughout their entire degree. This approach creates a close-knit, supportive environment, and for many of our students it's the highlight of their studies.

Life at AUT

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

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

We're here to help

No matter what the problem, the Student Hub is here to help. You can find a Student Hub on each campus and our specialist staff can help with anything from enrolment and student ID cards to matters far beyond university, like support with visa and immigration matters, StudyLink issues or landlord challenges.

Dedicated support for new students

From Orientation to our many academic and cultural support programmes, our student support services are there to make starting out as a new student as easy as possible.

Creating career-ready graduates

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

Gain an edge on the competition

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

International study opportunities

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

Helping you succeed in your studies

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

Top internships around the world

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

A launchpad for entrepreneurs

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

An outstanding learning environment

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

Free access to digital tools and resources

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

Getting involved in campus life

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

Join a gym or sports team

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

Holistic approach to wellness

AUT offers comprehensive medical, counselling and mental health services. We also run Te Puna Oranga, an integrated programme that regularly hosts wellness-related events on campus.

Disability student support and resources

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

Getting around

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

Safe and friendly campuses

We make sure that our students are – and feel – safe. Our friendly security staff are available day and night to help if you have any concerns.

Practical experience during your study

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

You study in an interactive environment and frequently get out of the classroom to apply your knowledge. You might find yourself diving in the ocean to examine marine life, investigating forest dynamics on Mt Ruapehu, testing food products in our food sensory suite or carrying out analyses in laboratories. There are no fees for our field trips, unlike at other universities¹.

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

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

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



Samir Brown Bachelor of Science (Honours) student Bachelor of Science in Food Science

"In my final year, I worked with Frucor Suntory, which produces popular drinks like V Energy Drink, Just Juice, Fresh Up, H2go, Mizone and many more. During my year at Frucor Suntory, I conducted a process capability analysis of all products produced on a new manufacturing line and made recommendations for improvement. This experience truly made me appreciate the significance of what was taught in the lectures and labs at AUT. This valuable industry experience will greatly assist me in the future and in my current research. I was also lucky enough to be offered a full-time position for the summer break before I started my Bachelor of Science (Honours)."

Bachelor of Science [BSc | AK1041] Overview

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

Entry requirements

Minimum entry requirements

University Entrance or equivalent

English language requirements

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

Useful New Zealand school subjects

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

Don't meet the entry requirements?

Consider starting with our Certificate in Applied Science.

Majors

- Applied Conservation
- Biomedical Science
- Chemistry
- Environmental Sciences
- Food Safety
- Food Science
- Geoscience

- Geospatial Science
- Health Protection
- Marine Biology
- Microbiology
- Molecular Genetics
- Psychology

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

QUICK FACTS

Level:	7
Points:	360
Duration:	3 years F/T, 6 years P/T ¹
Campus:	City
Starts	24 Eeb & 13 July 2020



Hanisah Hasny

Graduate Food Technologist, Langdon Ingredients, Melbourne Bachelor of Science in Food Science

"I chose AUT because I was aware that from the beginning of the first year I would be studying subjects that are very much related to my major, rather than having to wait for my second year to take papers that actually contribute to my major. I also liked that studying food science at AUT covered both theory and practical components. I found this very important because once you transition into the workforce, employers are also interested in the amount of practical skills you've gained, especially in the food industry. One of the things AUT encourages in students is innovation. This is an advantage because we live in a world that's continuously changing and always adapting to new technologies. The fact that AUT offers learning techniques that suit our everchanging society makes the university relevant and prepares students to face their future pathway."

Bachelor of Science [BSc | AK1041]

Overview continued



Study science majors not available anywhere else in NZ



Jeremy Li China 3rd-year student, Bachelor of Science in Environmental Sciences and Marine Biology

"When I was in primary school I became interested in the different fish that live in the ocean. After I finished my high school in China, my parents decided to send me abroad, and they let me choose the university and the degree I wanted to study. Marine biology was my first choice. I decided to study at AUT because it is well-known as the fastest growing university in New Zealand and is known for connecting students with employers by providing lots of opportunities to intern or volunteer. One of my greatest experiences at AUT was the paper Pacific Island Coastal Ecology. As part of this paper we all went to the Solomon Islands for three weeks to study the relationship between the coral reef and the rainforest. This was one of the best experiences in my life."

What this qualification covers

Year 1

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

Year 2 & 3

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

Double your career options – study science and:

Bachelor of Business (conjoint)

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

Scholarships

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

AUT encourages early application. Places are limited².

1. You can change from full-time to part-time at any point in your study.

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



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 ¹	Knowledge, Enquiry & Communication Health & Environment		
Applied Conservation	Plants & Animals Ecology & Evolution	Environmental Law Research Techniques	Applied Conservation Ecosystem Management
	Biological Sampling & Interpretation	Geographic Information Systems	Socio-ecological Systems
	Human Geography	Biogeography	PLUS 5 electives
	PLUS 2 level 5 electives	TWO OF: • Freshwater Ecology • Terrestrial Ecology • Fish & Aquatic Plants • Marine Invertebrates • Plant and Animal Taxonomy PLUS 1 elective	ok Selectives a kesearch i foject
Biomedical Science	Principles of Chemistry Biological and Solution Chemistry	Analytical Chemistry Human Anatomy & Physiology II	Pharmacology for Professional Practice
	Microbiology	Methods of Research & Enquiry	Natural Compounds
	Biological Sampling & Interpretation	Cells, Genes and Molecules	Biomedical Science
	Human Anatomy and Physiology I	Biochemistry	Biomedical Technology
	PLUS 1 level 5 elective	PLUS 3 electives	PLUS 4 electives OR 2 electives & Research Project
Chemistry	Principles of Chemistry Biological and Solution Chemistry Biophysics PLUS 3 level 5 electives	 FOUR OF: Analytical Chemistry Physical Chemistry Biochemistry Organic Chemistry Inorganic Chemistry Coordination Chemistry (delivered offshore only) PLUS 4 electives 	 THREE OF: Surfaces, Colloids & Nanotechnology Advanced Inorganic Chemistry Instrumental Analytical Chemistry Organic Synthesis & Molecular Design Protein & Metabolic Chemistry Natural Products Environmental Chemistry Modern Topics in Organic Chemistry (offered offshore only) Advanced Food Chemistry
			OR 3 electives & Research Project
Environmental Sciences	Plants & Animals	Environmental Risk Assessment	Plant Ecology
			Acimal Rehavious and Ecology
	DI US 2 lovel 5 electives	Environmental Law	
			OR 3 electives & Research Project
		PLOS 5 electives	
Food Safety	Principles of Chemistry	Environmental Risk Assessment	Food Industry Legislation
	Riological and Solution Chemistry	Eood Misrobiology	Health Protection
	Microbiology		Advanced Food Microbiology
	Biological Sampling & Interpretation	Quality Assurance	PLUS 4 electives OR 2 electives & Research Project
Food Science	Principles of Chemistry	Analytical Chemistry	Advanced Food Microbiology
	Food Science	Food Microbiology	Advanced Food Chemistry
	Biological and Solution Chemistry	Food Process Engineering	Sensory Evaluation
	Biophysics	Food Technology	PLUS 5 electives
	Microbiology	Food Chemistry	OR 4 electives &
	Biological Sampling & Interpretation	PLUS 3 electives	OR 3 electives & Research Project

1. Or equivalent, depending on your chosen major.

Refer to the next page for more majors and papers.

Course planner – Bachelor of Science continued

MAJORS	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)
Geoscience	Biological Sampling & Interpretation Principles of Chemistry Our Dynamic Earth Ecology & Evolution PLUS 2 level 5 electives	Geology, Landscape & Environment Environmental Risk Analysis Research Techniques Geographic Information Systems Sedimentary Rocks & Environments PLUS 3 electives	AT LEAST THREE OF: • Remote Sensing • Oceanography • Structural Geology & Tectonics • Earth Materials • Geohazards & Risk • Volcanology
			PLUS 5 electives OR 3 electives & Research Project
Geospatial Science	Plants & Animals	Environmental Law	Geospatial Analysis
	Ecology & Evolution	Research Techniques	, Remote Sensing
	Biological Sampling & Interpretation	Geographic Information Systems	Ecosystem Management
	Our Dynamic Earth or Human Geography	Biogeography	PLUS 5 electives
	PLUS 2 level 5 electives	Planning for Environmental	OR 3 electives & Research Project
		Sustainability	
		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
	Endeminion	Ceographic Information Systems	OR 3 electives & Research Project
	PLUS 1 level 5 elective	Communicable Diseases	
		PLUS 2 electives	
Masia - Diala au	Diante & Animale		Masing Ecology
магіпе віоїоду	France & Animals Ecology & Evolution	Marine Invertebrates	
	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 and Solution Chemistry	Food Microbiology	Biotechnology
	Ecology & Evolution	Biochemistry	Molecular Genetics
	Principles of Chemistry	Industrial Missobiology	PLUS 5 electives
	FL032 level 5 electives		on scientifics a nescale in roject
			Lawrence of
Molecular Genetics	Microbiology Biological and Solution Chemistry	Principles of Genetics	I HREE OF: Protein and Metabolic Chemistry
	Biological Sampling & Interpretation	Biochomistry	Molecular Genetics
	Principles of Chemistry	Cells Genes & Molecules	Molecular Diagnostics
	PLUS 2 level 5 electives	PLUS 4 electives	Computational Genetics Microbial Genetics
			PLUS 5 electives
			OR 3 electives & Research Project
Psychology	Biological Sampling and Interpretation	Research Techniques	AT LEAST THREE OF:
	Introduction to Psychology B	AND AT LEAST FOUR OF:	Experimental & Applied
	 Introduction to Psychology A (PSYC501) 	Psychological Assessment Brain and Behaviour	Behaviour Analysis
	 Introduction to Psychology A (PSYC580) 	Cognitive Psychology	 Critical Evaluation in Psychology Biopsychology
	AND 2 level 5 electives	Abnormal Psychology Secial Psychology	 Positive Psychology
		 Individuals & Identities 	Applied Issues in Cultural &
		Personality	Experimental & Applied Behaviour
		PLUS 3 electives	Analysis II
			Health Psychology
			Psychological Intervention
			Advanced Research Methods in
			Psychology
			OR 3 electives & Research Project

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

- Algebra & Discrete Mathematics
- Biodiversity
- Biological and
- Solution Chemistry
- Biological Sampling & Interpretation
- Biophysics
- Differential & Integral Calculus
- Ecology & Evolution
- Food Science
- Health & Environment
- Human Geography
- Human Anatomy & Physiology I
- Introduction to Psychology A
- Introduction to Psychology B
- Microbiology
- Our Dynamic Earth
- Plants & Animals
- Principles of Chemistry

Level 6

- Analytical Chemistry
- Aquaculture
- Biochemistry
- Biogeography

- Brain & Behaviour
- Cells, Genes & Molecules
- Cognitive Psychology
- Communicable Diseases
- Conservation Planning
- Environmental Health
- Environmental Law
- Environmental Microbiology
- Environmental
- Risk Assessment
- Fish & Aquatic Plants
- Food Chemistry
- Food Microbiology
- Food Technology
- Freshwater Ecology
- Geographic Information
- Systems (GIS) • Geology, Landscape &
- Environment
- Inorganic Chemistry
- Industrial Microbiology
- Marine Invertebrates
- Medical Microbiology I
- Organic Chemistry
- Physical Chemistry
- Planning for
 - Environmental Sustainability

Sarah McFarlane

throughout my degree."

Bachelor of Science in Microbiology

Microbiology Technician, Tuatara Brewing, Paraparaumu

"My interest in microbiology started at a young age. My dad got me interested in homebrewing, and I soon discovered that I was really passionate about yeast and bacteria. It's fascinating how something so small can have a big impact on things. I liked that AUT had close links with industry partners, and a strong focus on food science and the industrial application of microbiology. In my final year I undertook a research project to explore how different yeast affects beer. I enjoyed that I was able to research something I was passionate about and could apply the knowledge that I had learnt

- Plant & Animal Taxonomy
- Principles of Genetics
- Research Techniques
- Sedimentary Rocks & Environments
- Social Psychology
- Terrestrial Ecology

Level 7

- Advanced Analytical Chemistry
- Advanced Food Chemistry
- Animal Behaviour & Ecology
- Applied Conservation
- Biomedical Science
- Biomedical Technology
- Biotechnology
- Computational Genetics
- Earth Materials
- Ecosystem Management
- Food Industry Legislation
- Food Product Development (30pts)
- Food Safety Systems
- Geohazards & Risk
- Geospatial Analysis
- Health Protection
- Instrumental
 - Analytical Chemistry

- Marine Ecology
- Modern Topics in
- Organic Chemistry
- Molecular Genetics
- Natural Compounds
- Oceanography
- Organic Synthesis and Molecular Design
- Pacific Islands Coastal Ecology
- Pharmacology for
- Professional Practice
- Plant Ecology
 - Protein and
 - Metabolic Chemistry
 - Remote Sensing
 - Research Project (30pts)
 - Sedimentary Rocks & Processes
 - Sensory Evaluation
 - Socio-ecological Systems
 - Surfaces, Colloids &
 - Nanotechnology
 - Structural Geology & Tectonics

13

Volcanology





- 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 teacher¹
- Conservation scientist for Department of Conservation, regional or city councils or Non-Government Organisations (NGOs) including Conservation International or WWF

Bachelor of Science Applied Conservation

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

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

What this major covers

Year 1

Papers you take this year include:

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

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

Year 2 & 3

Papers include:

- Applied Conservation
- Biogeography
- Conservation Planning
- Ecosystem Management
- Environmental Law
- Fish and Aquatic Plants²
- Freshwater Ecology²
- Geographic Information Systems
- Marine Invertebrates²
- Plant and Animal Taxonomy
- Research Techniques
- Socio-ecological Systems
- Terrestrial Ecology²

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

Workplace experience

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

Institutes and employer organisations involved include:

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

Scholarships

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1. After completing a graduate diploma in education.

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



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



Lorenzo Fiori Italy Doctor of Philosophy candidate

"I'm currently exploring how to interact with humpback whales in a way that maintains their safety and conservation, while also giving people an opportunity to appreciate these majestic creatures up close. My research looks at cetacean interactions with tourism activities, as well as the use of small unmanned aerial vehicles (UAVs) as a tool for cetacean research.

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

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

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

UNDERGRADUATE

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 and Communication
- Health and Environment
- Principles of Chemistry
- Biological and Solution Chemistry
- Human Anatomy and Physiology I
- Microbiology
- Biological Sampling and 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 and Physiology II
- Biochemistry
- Methods of Research and Enquiry
- · Cells, Genes and Molecules
- Pharmacology for Professional Practice
- Natural Compounds
- Biomedical Science
- Biomedical Technology

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

Workplace experience

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

Scholarships

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



Seyedehsara (Sara) Masoomi Dezfooli Iran 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 strengths. 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."

UNDERGRADUATE



- Develop skills relevant to a wide range of industries
- Discover how chemistry is central to the world we live in
- 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 teacher¹

Bachelor of Science **Chemistry**

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

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

What this major covers

Year 1

Papers you take this year include:

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

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
- Inorganic Chemistry
- Organic Chemistry
- Instrumental Analytical Chemistry
- Advanced Inorganic Chemistry
- Surfaces, Colloids and Nanotechnology
- Organic Synthesis and Molecular Design
- Protein and Metabolic Chemistry
- Modern Topics in Organic Chemistry (only offered offshore)
- Natural Products
- Environmental 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.

Workplace experience

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

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Emma Matthewman 2nd-year student, Bachelor of Science in Chemistry

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

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

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

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



- 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 teacher¹
- Scientific laboratory analyst

Bachelor of Science Environmental Sciences

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

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

What this major covers

Year 1

Papers you take this year include:

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

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

Year 2 & 3

Papers include:

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

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

Workplace experience

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

Companies or research organisations involved include:

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

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Claire Ellis Final-year student, Bachelor of Science in Environmental Sciences

"I spent six weeks in South Africa, and after meeting the lead ecologist at a game reserve I decided to study the Bachelor of Science in Environmental Sciences. It was a career I could see myself pursuing in the future.

"I chose to study at AUT after I went to a science talk at my high school where two lecturers spoke about AUT's intention to equip students with a lot of practical knowledge. I believe that AUT prepares students for the competitive job market by focusing more on the practical knowledge than other universities.

"I've enjoyed the analytical side of science; the experiment design and analysis of data. I loved learning about biogeography, plant ecology and statistics, and am proud of being awarded a Department of Conservation scholarship to work on Alpine flushes on Mt Ruapehu in the summer of 2017. The highlight of my time at AUT, however, was spending two weeks in the Solomon Islands on a field trip. It was an incredible experience, made even better by the people who were on it.

"I've recently been hired as a monitoring and research student at the Auckland Council Research and Evaluation Unit, RIMU. I'll be working there for the 12 weeks and learning heaps of industryrelevant skills."

UNDERGRADUATE

KEY FEATURES:

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

SEE YOURSELF AS:

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

CAREER OPPORTUNITIES:

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

Bachelor of Science Food Safety

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

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

What this major covers

Year 1

Papers you take this year include:

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

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

Scholarships

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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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Saipriya Shahi

Quality Assurance Coordinator, Produco, Hamilton Bachelor of Science in Food Science

"As a food safety consultancy company, Produco works with and provides advice to food and dairy companies to help them become compliant with New Zealand regulations. We also provide expert advice for products that are being exported overseas and for getting products imported to different countries.

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

"Every day is different. Some days I'll be on site studying the plant or visiting a farm; another day I'll be in the company's office working on documents, running audits, closing non-conformances or working through investigations for quality or contamination checks. And on other days I could be in training or building client connections in locations with beautiful views.

"I just loved the overall experience of studying at AUT. The academic staff were extremely supportive. They genuinely wanted their students to not only learn but to do the best they possibly could. But the best part about studying at AUT has to be the practical experience you gain as part of your degree. It really prepares you to step out into the real world straight after graduation, and it also helps you recognise how well you've understood the content."

UNDERGRADUATE

KEY FEATURES:

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

SEE YOURSELF AS:

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

CAREER OPPORTUNITIES:

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

Bachelor of Science Food Science

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

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

What this major covers

Year 1

Papers you take this year:

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

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

Year 2

Papers you take this year:

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

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

Year 3

Papers you take this year:

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

You also choose elective papers¹.

Workplace experience

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

Companies or research organisations involved include:

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

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Svetlana (Lana) Philcox Russia 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."

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

^{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.



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

SEE YOURSELF AS:

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

-0-

CAREER OPPORTUNITIES:

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

Careers this major can lead to include:

- Geological scientist for government departments, regional or city councils or non-government organisations (NGOs) like Greenpeace, Oxfam, WaterAid, Land Information NZ, Department of Conservation, Department of Primary Industries, Ministry of Foreign Affairs and Trade, Ministry for the Environment and Ministry of Business Innovation and Employment
- Private consultancies for environment, construction, infrastructure, resources and geohazards
- Research scientist for NIWA, Land Information NZ, World Bank, Green Technogy industries, and Mining, Oil and Gas industries
- Science teacher¹

Bachelor of Science **Geoscience**

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

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

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

What this major covers

Year 1

Complete the following papers:

- Knowledge, Enquiry and Communication
- Health and Environment
- Principles of Chemistry

And at least two of:

- Introductory Astronomy
- Biological and Solution
- Chemistry
- Biophysics

Year 2 & 3

Papers include:

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

- Ecology and Evolution
- Biological Sampling and Interpretation
- Our Dynamic Earth
- Biodiversity
- Human Geography
- Microbiology
- Plants and Animals
- Oceanography
- Remote Sensing
- Structural Geology and Tectonics
- Earth Materials
- Volcanology
- Geohazards and Risk

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

Workplace experience

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

Institutes and employer organisations involved include:

- Auckland Council
- Department of Conservation
- SCION (Rotorua)
- GNS Science
- NIWA
- Land Information NZ
- Department of Primary Industries
- Ministry of Foreign Affairs and Trade
- Ministry for the Environment
- Ministry of Business Innovation and Employment
- Private consultancies for environment, construction, infrastructure and resources

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- Disaster and risk agencies in NZ and internationally
- WaterAid
 - Greenpeace
 - Oxfam
 - World Bank
 - UN and regional development environmental scientific and cultural agencies
 - Mining, and oil and gas industries
 - Green technology industries
 - National and regional park agencies



Hinengarangi Makoare

Niuean, Ngāti Whātua, Te Rarawa 2nd-year student, Bachelor of Science in Applied Conservation and **Geospatial Science**

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

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

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

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

UNDERGRADUATE



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

SEE YOURSELF AS:

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

CAREER OPPORTUNITIES:

- Environmental planner
- → GIS analyst or consultant
- $\rightarrow~$ Natural resource or hazard manager
- Sustainable development planner
- → Geography teacher¹
- Geospatial scientist for Crown-owned Research Institutes, government departments and local government

Bachelor of Science Geospatial Science

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

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

What this major covers

Year 1

Papers you take this year include:

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

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

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Sally Be

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

"Whether you want a career in geographic information science or want to develop an additional skill, I believe having expertise in GIS is beneficial in whatever career path you choose. 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.

"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.

"I've seen how many of our projects, tasks and functions heavily depend on the integrative and analytical power of GIS. The team is always open to new ideas and I'm able to fully immerse myself in my work and look for ways to carry out tasks and functions more smartly and efficiently.

"I liked that AUT's geographic information science programme offers a good mix of skills in a variety of disciplines including health, remote sensing and conservation. I also knew that the GIS internship the department offered would be a great opportunity to upskill and gain valuable work experience in a professional GIS working environment."

UNDERGRADUATE



- 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
- → Biosecurity²
- → Ministry for Primary Industries²

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 officer¹.

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

What this major covers

Year 1

Papers you take this year include seven compulsory papers:

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

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

Scholarships

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

After gaining experience there is the opportunity to work in biosecurity or the Ministry for Primary Industries.

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



For more details visit 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 teacher¹

Bachelor of Science Marine Biology

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

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

What this major covers

Year 1

Papers you take this year include:

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

Year 2 & 3

Papers include:

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

Companies or research organisations involved include:

- NIWA
- New Zealand Premium Whitebait
- OceaNZ Blue

Scholarships

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

AUT encourages early application. Places are limited².

1. After completing a graduate diploma in education.

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



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



Johnny Pearce

Aquaculture Technician, Manaki – New Zealand Premium Whitebait Bachelor of Science (Honours) Bachelor of Science in Marine Biology

"I've been a keen fisherman since I was a boy and always had an interest in New Zealand's marine environment. I chose marine biology because I wanted to study in a field I enjoy, and studying fish and their habitats was the obvious choice for me. I came to AUT because it has a reputation for providing practical experiences and I liked the idea of smaller, more interactive classes.

"I enjoyed the practical aspects of my papers, especially the field trips. One of the highlights for me was the aquaculture field trip to NIWA's Bream Bay facility where they're breeding kingfish and hapuka in captivity. It was amazing to see what is possible in New Zealand aquaculture, and this experience made me really want to get into the industry.

"In my career now I love working with one of New Zealand's most unique fish on a daily basis. We're farming a species of endangered native fish called the giant kokopu (Galaxias argenteus) for whitebait production and to restock wild populations. I enjoy that we're constantly problem solving and trying to work out better ways to work and keep these rare fish. The biology, ecology and chemistry skills I gained at AUT are vital to my work now."

UNDERGRADUATE

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
- \rightarrow 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 teacher¹

Bachelor of Science **Microbiology**

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

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

What this major covers

Year 1

- Papers you take this year include:
- Knowledge, Enquiry and Communication
- Health and Environment
- Microbiology
- Biological and Solution Chemistry
- Ecology and Evolution
- · Principles of Chemistry

Year 2 & 3

Papers include:

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

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

Workplace experience

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

Companies or research organisations involved include:

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

Scholarships

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

UNDERGRADUATE



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

SEE YOURSELF AS:

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

CAREER OPPORTUNITIES:

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

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

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

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

Bachelor of Science Molecular Genetics

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

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

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

What this major covers

Year 1

Complete the following papers:

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

And at least two of:

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

Year 2 & 3

Papers include:

- Biochemistry
- · Principles of Genetics
- · Cells, Genes and Molecules
- Research Techniques
- Protein and Metabolic Biochemistry
- Molecular Genetics
- Molecular Diagnostics
- Computational Genetics
- Microbial Genetics

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

Workplace experience

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

Institutes and employer organisations involved include:

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

Scholarships

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

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Priyadarshana (Priya) Ajithkumar Researcher Master of Science

"I investigated the Lettuce necrotic yellows virus, which infects lettuce in New Zealand and Australia. It can cause major losses to lettuce farmers, and can also infect the New Zealand native puha, Sonchus kirkii, which is an endangered plant.

"My first aim was to develop a molecular diagnostic test to distinguish between the subgroups of this virus. The test I've developed is faster, more efficient, accurate and sensitive than the conventional methods. It will help farmers reduce the progression of the virus in lettuce crops by identifying the virus faster.

"There's very little known about viruses in native New Zealand plants. Since the virus can infect the endangered puha, it's important to understand how the virus population is changing and whether or not this will have a significant impact on a plant species that is already vulnerable. What we learn through this research may help with protecting our most at risk plants.

"Studying at AUT has inspired me to work in molecular genetics research, and continue being involved in research that will help the New Zealand environment and communities. I'm currently finishing the analysis from my master's research, and am planning to publish the data in a scientific journal this year. I'm also working on a research project to determine the effects of kauri dieback on fungi for Manaaki Whenua – Landcare Research."

UNDERGRADUATE



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

SEE YOURSELF AS:

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

CAREER OPPORTUNITIES:

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

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

Bachelor of Science **Psychology**

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

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

What this major covers

Year 1

Complete the following papers:

- Knowledge, Enquiry and Communication
- Health and Environment
- Biological Sampling and Interpretation
- Introduction to Psychology B

And at least one of:

- Introduction to Psychology A (PSYC501)
- Introduction to Psychology A (PSYC580)

And at least two of:

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

Year 2 & 3

Papers include:

- Research Techniques
- Abnormal Psychology
- Social Psychology
- Psychological Assessment
- Personality
- Brain and Behaviour
- Individuals and Identities
- Cognitive Psychology
- Advanced Research Methods in Psychology
- Experimental and Applied Behaviour Analysis
- Critical Evaluation in Psychology

- Experimental and Applied Behaviour Analysis II
- Biopsychology
- Positive Psychology
- Health Psychology
- Approaches to Psychological Intervention
- Emotions and Human Nature
- Applied issues in Cultural and Social Psychology

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

Workplace experience

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

Institutes and employer organisations involved include:

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

Scholarships

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

AUT encourages early application. Places are limited ¹.

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



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

QUICK FACTS

Level:	8
Points:	480
Duration:	4 years F/T, equivalent P/T
Campus:	City
Starts:	24 Feb 2020



Mitchell Baber Final-year student, Bachelor of Science in Applied Conservation and Geospatial Science

"The beauty of studying science is that it can open up so many careers. I could end up working for the Department of Conservation, NIWA, Auckland Transport or work at a council, and with postgraduate study I have the potential to go on to doing my own research or move into teaching. I've decided to take my understanding of science further and transfer into AUT's Bachelor of Advanced Science (Honours). I heard really good things about the new Bachelor of Advanced Science (Honours), and I like that it expands on the topics I really enjoy, like conservation in New Zealand and biogeography. I'm also excited about getting to do my honours research project under the guidance of AUT's amazing staff. For my research project, I'm planning to focus on the Pericoptus, a New Zealand native scarab beetle. I feel that there's a really exciting year ahead."

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

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

Entry requirements

Minimum entry requirements

- Applicants must have completed one or more years in a Bachelor of Science with a B+ grade average or
- Achieved NCEA level 3 with at least 260 points and at least 16 credits each in two approved subjects, or equivalent CIE, or IB in university approved subjects

English language requirements

IELTS (Academic) 6.5 overall with a minimum score of 6.0 in each band

Specialisations

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

Applied Conservation

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

Biomedical Science

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

Chemistry

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

Environmental Science

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

Food Science

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

Geospatial Science

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

Microbiology

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

Molecular Genetics

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

What this qualification covers

You complete 480 points including either the postgraduate research project (60 points) in which you gain skills in scientific research and in drafting a paper in a format suitable for a scientific journal publication, or the dissertation (45 points). Refer to the course planner on page 42 for details.

AUT encourages early application. Places are limited².

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

KEY FEATURES:

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



SEE YOURSELF AS:

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



CAREER OPPORTUNITIES:

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

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

Course planner – Bachelor of Advanced Science (Honours)

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

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

SPECIALISATIONS	LEVEL 5 (Year 1)	LEVEL 6 (Year 2 & 3)	LEVEL 7 (Year 2 & 3)	LEVEL 8 (Year 3 & 4)
Geospatial Science	 TWO OF: Plants & Animals Ecology & Evolution Biological Sampling & Interpretation Our Dynamic Earth 	Ervico (tear 2 or 3) Environmental Law Research Techniques Geographic Information Systems Biogeography Planning for Environmental Sustainability	Geospatial Analysis Remote Sensing Ecosystem Management	Quantitative Analysis 60 POINTS FROM: • Applications of Geographical Information Systems • Advanced Applications in Geographic Information Systems • GIS Databases and Programming
				 Geospatial Science for Conservation Advances in Remote Sensing Advances in Geospatial Analysis
Microbiology	TWO OF: • Principles of Chemistry • Microbiology • Biological and Solution Chemistry • Ecology & Evolution	Environmental Microbiology Food Microbiology Biochemistry Industrial Microbiology Principles of Genetics Cells, Genes & Molecules	Advanced Food Microbiology Biotechnology Molecular Genetics	 Quantitative Analysis FOUR OF: Frontiers of Food Microbiology (30 pts) Selected Topics in Microbiology (30 pts) Contemporary Molecular Genetics (30 pts)
Molecular Genetics	 TWO OF: Biological Sampling and Interpretation Principles of Chemistry Biological and Solution Chemistry Microbiology 	Biochemistry Principles of Genetics Cells, Genes & Molecules Research Techniques	Molecular Genetics Computational Genetics Protein and Metabolic Chemistry	Quantitative Analysis 60 POINTS FROM: • Biomedical Ethics (30 pts) • Contemporary Molecular Genetics (30 pts) • Bioinformatics • Specialist Readings

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:	24 Feb 2020



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

"The Bachelor of Medical Laboratory Science is a multidisciplinary degree that offers not one, but two 15-week clinical placements, which helps you understand more about the work you'll be doing in the foreseeable future. The experiences gained from these clinical placements have certainly opened up my eyes about what the clinical world is all about. At the end of my second placement, I was offered to stay and work part-time in a diagnostic laboratory while finishing my final semester at AUT. The part-time position at the Liggins Institute transitioned into a full-time position post-graduation. After working for just over a year now, I remind myself of how fortunate I am to be offered a permanent full-time position at IGENZ Limited. I'm working as a medical laboratory scientist, specialised in diagnostic genomics, and love using my skills to support cancer patients in New Zealand."

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

Entry requirements

Minimum entry requirements

University Entrance or equivalent including:

- NCEA: 14 or more credits at level 3 in each of Biology, Chemistry and Statistics
- **CIE:** A D grade or better at AS or A level in each of Biology, Chemistry and Statistics

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

English language requirements

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

Required New Zealand school subjects Biology, Chemistry, Statistics

Don't meet the entry requirements?

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

What this qualification covers

Year 1

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

Papers you take this year:

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

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

Year 2

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

Year 3

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

Year 4 (workplace experience)

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

- LabPLUS
- Labtests NZ
- New Zealand Blood Service

AUT encourages early application. Places are limited ¹.

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



For more details visit 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 – Bachelor of Medical Laboratory Science

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

480 points total

120

Certificate in Applied Science

CertAppSc | AK1018

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

Entry requirements

Minimum entry requirements

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

English language requirements

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

What this qualification covers

You choose eight papers from the following options¹:

- Applied Statistics
- Foundation Human Anatomy and
- Ecology and Evolution Foundation Algebra
- Foundation Statistics
- Foundation Biology
- Foundation Biophysics
- Foundation Chemistry
- Foundation Ecology

Career opportunities

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

AUT encourages early application. Places are limited².

1. Paper prerequisites may apply

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



QUICK FACTS

Level:	4
Points:	120
Duration:	1 year F/T, up to 2 years P/T
Campus:	City
Starts:	24 Feb & 13 July 2020

Physiology

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

CERTIFICATES & DIPLOMAS

	CV		СТ	-C
ŲΙ		ГА	C I	Э

Level:	5
Points:	120
Duration:	Standard diploma: 1 year F/T, P/T available Anaesthetic Technology: Offered P/T Pre-Chiropractic: 1 year F/T
Campus:	City
Starts:	24 Feb & 13 July 2020



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 and Pre-Chiropractic.

Entry requirements

Minimum entry requirements

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

Anaesthetic Technology: Letter of confirmation from Training Hospital. Applicants must be capable of meeting Health Practitioners Competence Assurance Act (HPCA Act) requirements including police clearance.

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

English language requirements IELTS

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

What this qualification covers

Standard diploma

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

- Biological and Solution Chemistry
- Biological Sampling and Interpretation
- Biophysics
- Ecology and Evolution
- Plants and Animals

- Principles of Chemistry
- Health and Environment (or Hāuora Māori and Environment)
- Knowledge, Enquiry and Communication
- Microbiology
- Human Geography

Anaesthetic Technology

This three-year diploma equips trainee anaesthetic technicians¹ 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:

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

You also choose one elective from the Bachelor of Science.

For more information regarding the Bachelor of Chiropractic please contact:

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

AUT encourages early application. Places are limited ³.

- 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.
- 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. 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



Dr Kevin Kantono

Sensory Scientist, Arla Foods Global Innovation Centre, Aarhus, Denmark Doctor of Philosophy Bachelor of Science (Honours) (First Class) Bachelor of Science in Food Science Diploma in Applied Science

"I'm responsible for developing the area of sensory and consumer science in the marketing and innovation environment at Arla Foods, both internally and externally through collaboration with research institutes and universities globally.

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

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

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

Graduate Di	iploma i	n Science
	TS	

Level:	7	
Points:	120	
Duration:	1 year F/T, 2 years P/T	
Campus:	City	
Starts:	24 Feb & 13 July 2020	

Graduate Certificate in Science **QUICK FACTS**

Level:	7
Points:	60
Duration:	½ year F/T, 1 year P/T
Campus:	City
Starts:	24 Feb & 13 July 2020

Graduate Diploma in Science GradDipSc | AK1042

Graduate Certificate in Science

GradCertSc | AK1043

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

Entry requirements

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

English language requirements

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

What these qualifications cover

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

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

AUT encourages early application. Places are limited ¹.

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



















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

Overview of our postgraduate qualifications

Bachelor of Science (Honours) (120 points)

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

Bachelor of Advanced Science (Honours) (480 points)

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

Postgraduate Certificate in Science and Postgraduate Diploma in Science

These qualifications equip students with advanced knowledge in 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: Applied Conservation, Biomedical Science, Chemistry, Environmental Science, Food Science, Geospatial 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: Applied Conservation, Biomedical Science, Chemistry, Environmental Science, Food Science, Geospatial 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.

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.





HOW TO APPLY

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

APPLY EARLY

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

APPLYING FOR 2020

- Semester 1
- apply by 2 December 2019
- Semester 2
 - apply by 1 May 2020

COMPLETE THE APPLICATION FORM

2

Apply online

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

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

SUBMIT YOUR APPLICATION

WE ACKNOWLEDGE YOUR APPLICATION

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

WE ASSESS YOUR APPLICATION

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

POSSIBLE OUTCOMES

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

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

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

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

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

ACCEPT YOUR OFFER

55

University admission to AUT bachelor's degrees

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

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

For more information on entry requirements, including entry requirements for international students, refer to the AUT Calendar or visit 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) and International Baccalaureate Diploma

 Programme (IB)
- Discretionary Entrance
- Special Admission

Common University Entrance requirements

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

1. UCAS (Universities and Colleges Admissions Services for the UK) Tariff = system which converts AS and A level grades into points.

2. New Zealand residents who have taken IB but have not been awarded the Diploma may apply for discretionary entrance.

3. IGCSE = International General Certificate of Secondary Education.

Where programmes require a specific subject, it is expected that a student will have achieved a minimum of 14 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

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

Alternative pathways into AUT bachelor's degrees

Students who have just missed University Entrance or did not get into their chosen degree could consider enrolling in one of the foundation studies certificates offered at AUT. Please visit

www.aut.ac.nz/universityentrance

Discretionary Entrance

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

International students can't apply for Discretionary Entrance.

You can apply if you:

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

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

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

Minimum academic criteria for Discretionary Entrance

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

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

The recommendation will provide proof of your maturity, motivation, capability and readiness to undertake degree-level study and also verify that you were not enrolled in Year 13 beyond 1 June in the year prior to admission. Please refer to the AUT Calendar or visit 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 and have completed Year 13 at a NZ secondary school, or equivalent.
- Have qualifications from an overseas secondary school or tertiary institution deemed by AUT to be sufficient for entry into an undergraduate degree programme.

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

Bursary

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

Special Admission

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

English language requirements

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

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

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

www.aut.ac.nz/englishrequirements

International students

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

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

Email: internationalstudy@aut.ac.nz

Fees & scholarships

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

To give you an idea of approximate costs, the 2019 tuition fees are shown below (based on full-time study and completing 120 points per year). All fees are in NZ dollars and include GST. The 2020 tuition fees will be advertised on www.aut.ac.nz/fees as soon as they have been set.

Domestic student tuition fees

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

Undergraduate programmes

Fee (per year)	Approximately \$3,290.00-\$7,130.00 ¹
----------------	--

Bachelor of Advanced Science (Honours)

Fee (per year) Approximately \$8,540.00

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

International student tuition fees

Undergraduate programmes

Fee (per year)	Approximately \$17,160.00-\$36,590.00 ¹
гее (регуеат)	Abbiorectimately 217, 100.00-220,220.00

Bachelor of Advanced Science (Honours)

Fee (per year) Approximately \$35,820.00

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

Other fees you may have to pay:

- 2019 Compulsory Student Services Fee \$646.00 for 120 points or \$5.38 per academic point
- 2019 Building Levy \$71.00 for 120 points or \$0.59 per academic point
- Additional fees for course materials or elective papers (check with your faculty if there are additional fees for your programme)

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

To find out more about fees call **+64 9 921 9779** or the AUT Student Hub on **0800 AUT UNI** (0800 288 864).

Free fees for your university study

New government policy means that eligible domestic students starting tertiary education receive one year of full-time study fees-free¹.

To check if you're eligible for fees-free study in 2020 visit www.aut.ac.nz/fees

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

Scholarships and awards

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

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

Support for scholarship students

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

Student loans and allowances¹

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

1. For domestic students only

Help with planning and budgeting

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

StudyLink website

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

Find out more

AUT Open Day

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

Visit our website

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

Contact us online

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

Secondary schools

If you are a secondary school teacher or career advisor, our Future Students Team can help you with any questions you may have. Contact the team on +64 9 921 9239.

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.



@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.

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





This booklet is printed on paper which is certified by the Forest Stewardship Council (FSC). It is manufactured using FSC Mix source pulp from well managed and legally harvested forests. The inks are 100 percent vegetable oil based and the printer is FSC certified.

Campus maps



- Student lounge
- Gym Gym
- 🎯 Library
- 😨 Crech
- Breastfeeding and baby change roor



North Campus

90 Akoranga Drive Northcote, Auckland



Key

- (i) AUT Student Hub
- Café
- Conference facility
- Intercampus shuttle bus stop
- طی Mobility parks
- Student lounge
- Creche



0800 AUT UNI (0800 288 864)

Auckland University of Technology Auckland, New Zealand www.aut.ac.nz

Enquire now www.aut.ac.nz/enquire

CITY CAMPUS 55 Wellesley Street East, Auckland Central

NORTH CAMPUS 90 Akoranga Drive, Northcote, Auckland

SOUTH CAMPUS 640 Great South Road, Manukau, Auckland

