

Tohu Paerunga Wheako Pāngarau Postgraduate Applied Mathematics

Wherever problems need to be solved, mathematics has a role to play. Applied Mathematics makes essential contributions to the biological, information and physical sciences, economics, engineering and finance, but can also be applied to communications, linguistics and genetics.

From studying climate change, preventing structural damage due to earthquakes, to analysing neuronal dynamics in the brain – Applied Mathematics has a role to play. You will gain valuable skills that bring you to the frontiers of knowledge and the thrill of discovery that will provide you with the satisfaction of seeing mathematics at work.

Courses available in this subject include:

- Advanced Numerical Analysis
- Dynamical Systems
- Nonlinear Partial Differential Equations
- Mathematical Modelling
- Inverse Problems
- Stochastic Differential Equations

Choosing your supervisor

Supervisors can usually only take a small number of students, so make sure you talk to them sooner rather than later.

Choose an area you feel passionate about. Undertaking research involves successes as well as challenges, so choosing a topic you are genuinely interested in will help you overcome challenges and get through the tough times. Ensure you're compatible with your supervisor. Ask questions, seek advice and share your ideas with academic staff to find out their research interests, and whether you would be a good fit with their current projects.

Scholarships

You can apply for a range of scholarships when you apply for postgraduate study in Science.

science.auckland.ac.nz/scholarships



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Career opportunities

Applied Mathematics plays a fundamental role in providing the skills and framework needed to tackle many challenges.

Graduate study in mathematics can provide you with advanced knowledge and problem-solving skills applicable in any number of fields.

A good mathematical background enhances and develops your problem-solving skills, comprehension of abstract concepts and analytical and creative thinking. These are valued qualities in technical roles and in positions of leadership and management.

Our graduates take up positions in business, government, industry, research, planning, and environmental organisations.

Our graduates have been employed in the following jobs:

- Manager of device development, Alta Devices
- Analyst, Dimensional Fund Advisors
- Senior client representative, IBM
- Consultant, Gentrack Ltd
- Director of product and infrastructure, Zeald
- Actuary, PricewaterhouseCoopers
- Traffic engineer, Traffic Engineering Solutions

This subject is available in:

Bachelor of Science (Honours)

Postgraduate Diploma in Science

Master of Science

Master of Mathematical Modelling

Doctor of Philosophy

You may also be interested in our programmes in Computer Science, Statistics and Physics.

Find out more

about how your degree will be structured
and what courses you need to take at

science.auckland.ac.nz/pg-applied-maths

"I feel ecstatic and honoured to have my research recognised on the world stage."

Henry Chen

First Class Honours in Applied Mathematics.



Read Henry's full story at:
science.auckland.ac.nz/henry-chen-profile



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Tohu Paerunga Pūtaiao Hangarau

Postgraduate Computer Science

Whether you are interested in software engineering, systems development and evaluation, cyber security, intelligent systems, algorithms, or the theory of computing – we are living in an information age and have become dependent on information technology and the complex way that information is stored, transmitted and processed.

Postgraduate study in Computer Science is divided into two general areas: software systems and the theory of computing. Areas of research interests open to exploration include artificial intelligence, computer vision, cyber security, human-computer interaction, and quantum information science.

Courses available in this subject include:

- Computing Education
- Human-computer Interaction
- Network Defence and Countermeasures
- Parallel and Distributed Computing
- Security for Smart Devices
- System Security

Choosing your supervisor

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Career opportunities

Computer Science graduates can find careers in an ever-widening variety of industries and roles.

The heavy reliance on networks and the explosive growth of the internet have created a particular demand for people with skills in data communications, network design, cyber security, web development, and object-oriented programming.

Software design and development, data analysis, and user experience (UX) research and design are also in high demand as the need for companies to hire professional staff with computer expertise grows.

Our graduates have been employed in the following jobs:

- Software engineer, Google
- Chief technology officer, Roofstock
- Security product lead, Instart Logic
- Senior engineering manager, Castlight Health
- Architecture manager, Nvidia
- Network specialist, Optus
- Systems analyst, Australian Crime Commission
- Senior developer, Westpac
- Systems administrator, Sears Canada Inc

This subject is available in:

Bachelor of Science (Honours)

Postgraduate Diploma in Science

Master of Science

Doctor of Philosophy

You may also be interested in our programmes in Data Science, Digital Security, Information Technology, Logic and Computation, and Mathematics.

Find out more

about how your degree will be structured and what courses you need to take at

science.auckland.ac.nz/pg-comp-sci

"I am focusing on the problem of detecting harmful algal blooms in NZ lakes using satellite data, by applying machine learning techniques."

Olivier Graffeuille

Doctor of Philosophy in Computer Science.



Read Olivier's full story at:
science.auckland.ac.nz/olivier-graffeuille



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Tohu Paerunga Pūtaiao Raraunga

Postgraduate Data Science

Data Science is a rapidly growing field, giving individuals the ability to manage and analyse big data, and drive innovation in organisations across all industries. There are two options for a postgraduate qualification in Data Science: the Master of Data Science, and the Master of Professional Studies specialising in Data Science.

Both programmes cover a core of Computer Science and Statistics courses where you'll learn to apply techniques from large-scale data management, data mining, machine learning, statistical modelling and statistical analysis, and assemble theories and tools from computer science, statistics and domains of data science to create information, knowledge, or innovative products, from data.

Courses available in this subject include:

- Database Systems
- Big Data Management
- Algorithms on massive datasets
- Data Mining and Machine Learning
- Statistical Computing
- Statistical Data Mining

Choosing your supervisor

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The free software environment for
statistical computing and graphics.

Career opportunities

On the world stage, data science is a rapidly growing field with an unmet demand for suitably qualified graduates.

As a data scientist you need to be able to both manage and analyse the data and this programme will give graduates a unique combination of skills in data science and data management.

Not only will you be able to comprehend, process and manage data efficiently, you will also be able to extract value from data, so you can visualise and communicate it effectively.

Your ability to turn data into information, knowledge and products is what will drive innovation and lead to successful outcomes across a diverse range of businesses and organisations.

Our graduates have been employed in the following jobs:

- Chief analytics officer, Lab360 NZ
- Data consultant, Fonterra Cooperative Group Ltd
- Director of data science, Qrious
- Marketing research manager, IBM Enterprise Group
- Statistical analyst, Statistics New Zealand

This subject is available in:

Master of Data Science

Master of Professional Studies

Doctor of Philosophy

You may also be interested in our programmes in Computer Science, Information Systems, Information Technology, and Statistics.

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/pg-data-science

“I opted for the industry project, and it opened up many doors for graduate employment options – with a postgraduate offer of employment secured five months before I even graduated due to the alignment of my project to the direction of the industry – the Cloud, AI, and Machine Learning.”

Yifei Liu

Master of Data Science



Read Yifei's full story at:
auckland.ac.nz/science/yifei-liu



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Tohu Paerunga Haumaru Matihiko Postgraduate Digital Security

Learn how to protect assets, personal identity and technology from viruses, spyware and hackers by studying Digital Security.

With the explosion in the use of digital technology, there is a real need for people with the right skills in the design, planning and management of secure information technology infrastructure.

You'll learn how to identify vulnerabilities within a network, manage physical security and surveillance, and provide risk analysis for networks and systems.

You'll also have the opportunity to explore integral skills in digital security by working on projects about real industry problems, supervised by our researchers.

Courses available in this subject include:

- Advanced Information Security
- Cryptographic Management
- Security for Smart-devices
- Network Defense and Countermeasures
- Advanced Design and Analysis of Algorithms
- Advanced Topics in Human Computer Interaction

Choosing your supervisor

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Career opportunities

Any company that relies heavily on its information and technology systems has a particular need for a secure digital network. There is a demand for digital security specialists due to the increasing risks of disruption and compromise of information technology systems.

Our graduates learn the fundamentals of secure IT design, planning and management, which make this qualification very attractive to employers. You may find work in all types of industries including: airline, financial services, governmental services, healthcare and retail.

Our graduates have been employed in the following jobs:

- Information security analyst
- Network support engineer
- Security operations analyst
- Senior security specialist

This subject is available in:

Master of Professional Studies.

You may also be interested in our programmes in Computer Science, Data Science and Information Technology.

Find out more

about how your degree will be structured and what courses you need to take at

science.auckland.ac.nz/pg-digital-security

“I loved that the Advanced Science programme offered a comprehensive foundation in Computer Science, after which I had the freedom to specialise in Digital Security for my final two years.”

Namodh Edirisinghe

Bachelor of Advanced Science (Honours)
in Computer Science.



Read Namodh's full story at:
science.auckland.ac.nz/namodh-edirisinghe



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Tohu Paerunga Hangarau Mōhiohio

Postgraduate Information Technology

Combine the technological skills and business awareness that are essential to the development of smart-design and the security of the devices we use.

As an Information Technology student in the PGCertInfoTech programme you'll take practical, hands-on and lab-based courses to arm you with foundational skills for a career in IT. The PGCertInfoTech is unique in that it provides an alternative pathway for entry into the Master of Information Technology for students who do not possess IT-related qualifications. In the Master of Information Technology programme, you will take a mixture of technical courses, including from Computer Science, Software Engineering and Information Systems as well as develop invaluable experience with an industry internship.

The ICT industry is one of the fastest growing industries in the world and there is huge demand for graduates who possess the right skills to work in this exciting field.

Courses available in this subject include:

- Programming for Industry
- Programming with Web Technologies
- Security for Smart Devices
- Intelligent Software Agents
- Intelligent Vision Systems
- Big Data Management
- Computer Games Technology
- Cloud computing

Choosing your supervisor

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Any Bachelors degree

PGCertInfoTech

MInfoTech

ICT related Bachelors degree



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Career opportunities

The ICT industry is one of the fastest growing industries in the world and there is huge demand for graduates who possess the right skills to work in this exciting field.

Information Technology graduates are employed in roles as diverse as database developers and data security specialists. You can look forward to joining them as you ignite your career in the ICT industry.

You'll add value to New Zealand's vibrant, dynamic ICT sector as you acquire advanced, specialist technological skills; gain industry experience in the development and commercialisation of products and services; and understand the demands and expectations of a professional workplace.

Our graduates have been employed in the following jobs:

- Software engineer, Manhattan Associates
- Freelancer, Defined Crowd Corporation
- Treasury analyst, Price Waterhouse Cooper
- Network analyst, HCL Technologies
- Other jobs related to Information Technology include:
- Cloud computing specialist
- Cybersecurity specialist
- Internet/multimedia developer

This subject is available in:

Postgraduate Certificate in Information Technology

Master of Information Technology

You may also be interested in our programmes in Computer Science, Data Science and Digital Security.

Find out more

about how your degree will be structured and what courses you need to take at

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Te Arorau me te Mahi Rorohiko Tāura

Postgraduate Logic and Computation

Logic and Computation can help you develop conceptual and analytical skills and a deeper theoretical understanding. You'll examine the structure, design and limitations of symbolic representations and procedures in both human thought and computer software.

Postgraduate study in Logic and Computation combines a strong core of advanced courses in Computer Science and Philosophy, alongside Linguistics, Logic and Computation and Mathematics to explore the development of computer languages.

Some of the courses available in this subject include:

- Philosophical Logic
- Graph Theory and Combinatorics
- Semantics and Pragmatics
- Intelligent Software Agents
- Datamining and Machine Learning
- Computational Complexity
- Formal Syntax
- Mathematical Logic

Choosing your supervisor

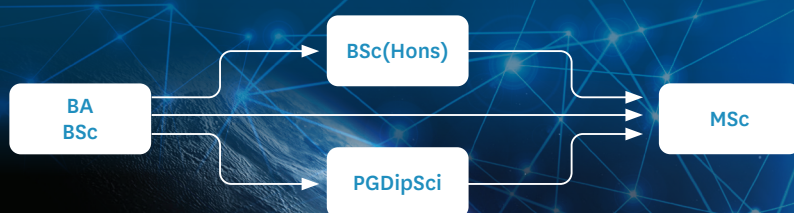
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Career opportunities

Logic and Computation can be useful for any career requiring skills in analysis, precise and creative thinking, and the ability to communicate clearly.

This is a rare and versatile combination of skills that is highly valued and sought after in the business world. You could also be in a position to have a career in research in universities or the IT industry.

Every industry is becoming more and more dependent on computing technology. With demonstrated skills in analytical thinking, communication and computing, our graduates can successfully navigate this ever expanding field.

Jobs related to Logic and Computation:

- Business, systems or security analyst
- Cloud systems or software engineer
- Communications and marketing
- Computer consultant
- Data, e-commerce solutions, software, information architect
- Database developer or administrator
- Digital designer
- Front end, game, systems or web developer
- Project manager

This subject is available in:

Bachelor of Science (Honours)

Postgraduate Diploma in Science

Master of Science

You may also be interested in our programmes in computer science, linguistics, mathematics and philosophy.

Find out more

about how your degree will be structured and what courses you need to take at

www.science.auckland.ac.nz/pg-logic-comp



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Tohu Paerua Whakatauirā Pāngarau Master of Mathematical Modelling

Mathematical models use the language of mathematics to describe, understand and evaluate systems. They are used in the natural sciences, social sciences and engineering disciplines.

This programme will deepen your theoretical understanding of mathematical models and their implementation, providing you with the expertise to transform a multidimensional real-world problem into a set of equations you can analyse with advanced theoretical and computational tools. You will learn to construct and use mathematical models to help solve questions ranging from the effects of global climate change to planning infrastructure, predicting financial fluctuations, managing disease epidemics, or designing better systems of healthcare and health equity

Courses available in this subject include:

- ENGSCI 711 Advanced Mathematical Modelling
- ENGSCI 721 Data-centric Engineering for Physical Systems
- MATHS 765 Mathematical Modelling
- MATHS 787 Special Topic: Inverse Problems and Stochastic Differential Equations

Choosing your supervisor

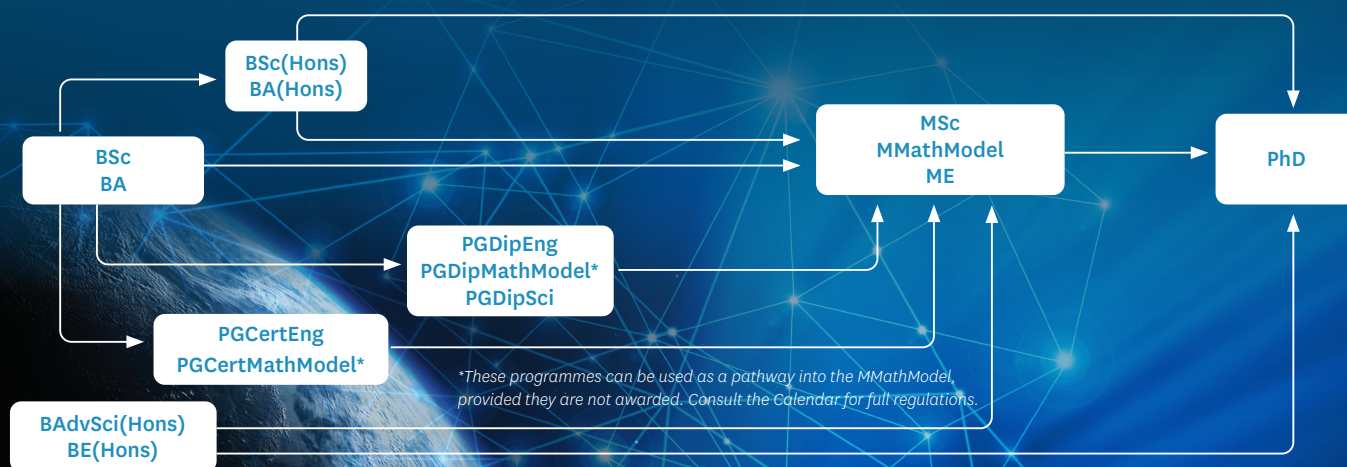
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Career opportunities

An advanced skill set of mathematical modelling will equip you to take advantage of a diverse range of career opportunities.

A Master of Mathematical Modelling will qualify you for positions as consultants and analysts in finance and professional services, provide critical direction to operations and policy through local and central government, or work on transformational research within research institutes. Equally, some students may wish to pursue an entrepreneurial route building on their university research towards commercialisation and spinout.

Jobs related to Mathematical Modelling

- Consultant
- R&D Scientist
- Modelling Specialist
- Meteorologist
- Data Scientist
- Entrepreneur

This subject is available in:

Bachelor of Engineering (Honours)

Master of Mathematical Modelling

Postgraduate Diploma in Mathematical Modelling

Postgraduate Certificate in Mathematical Modelling

Find out more

about how your degree will be structured and what courses you need to take at

auckland.ac.nz/science/master-of-mathematical-modelling

“My advice to anyone considering this programme is to be brave and curious. Take opportunities when they are presented to you, and they will often land you in a very interesting place.”

Ruisong Xue

Master of Mathematical Modelling (MMathModel) – 2022



Read Ruisong's full story at:
auckland.ac.nz/science/ruisong-xue



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Tohu Paerunga Pāngarau Postgraduate Mathematics

Postgraduate study in Mathematics enables you to indulge your academic enthusiasm or satisfy your intellectual curiosity, and at the same time provide you with advanced knowledge and problem-solving skills to open up many career opportunities, including mathematics education.

A postgraduate qualification in Mathematics will provide you with advanced knowledge and understanding across a broader and deeper range of topics. It will give you an opportunity to learn about research, conduct your own research, make new discoveries and develop new ways of looking at things.

Courses available in this subject include:

- Complex Analysis
- Functional Analysis
- Logic and Set Theory
- Number Theory
- Graph Theory and Combinatorics
- Group Theory
- Mathematics Education: Mathematical Processes
- Measure Theory and Integration

Choosing your supervisor

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Career opportunities

A good mathematical background enhances and develops your problem-solving skills, comprehension of abstract concepts, and analytical and creative thinking.

These skills are valued qualities in technical roles and positions of leadership and management - and can open up new career opportunities, and enhance your earning potential.

Our Mathematic graduates take up positions in business, industry or government, research and teaching, computer development and programming, systems analysis, operations research and many other fields.

Our graduates have been employed in the following jobs:

- Mathematician, University of California (Berkeley)
- Software engineer, Google Inc
- Researcher, Microsoft Corporation

- Managing partner, Park Avenue Value Partners LLC
- Postdoctoral researcher, Weill Cornell Medical College
- Principals and managing broker, Cornerstone Property Professionals LLC
- Senior analyst, Defence Science and Technology Organisation
- Game Designer, Bally Technologies

This subject is available in:

Bachelor of Science (Honours)

Postgraduate Diploma in Science

Master of Science

Doctor of Philosophy

You may also be interested in our programmes in Applied Mathematics, Computer Science, Physics and Statistics.

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science.auckland.ac.nz/pg-maths

“Everyone involved in the programme is passionate about mathematics and committed to helping you learn and succeed.”

Isabelle Steinmann

Masters in Mathematics



Read Isabelle's full story at:
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Tohu Paerunga Mātauranga Pāngarau

Postgraduate Mathematics Education

Mathematics Education is vital to ensure young people are numerate, understand how the world works and are equipped for future careers. Understanding how students learn Mathematics and the most effective ways of teaching it are at the heart of this subject.

High-quality Mathematics Education informs education, science, technology and engineering. As well as ensuring a numerate, highly skilled society, Mathematics Education provides the foundation for teaching young people important skills in logic, critical and creative thinking, problem solving, seeking evidence and analysing data.

Courses available in this subject include:

- Mathematical Processes in the Curriculum
- Teaching and Learning in Algebra
- Affect and Aesthetics in Mathematics Education
- Topics in Statistical Education
- Technology and Mathematics Education
- Special Topics in Mathematics Education
- Theoretical Issues in Mathematics Education
- Introduction to Research in Mathematics Education

More about this programme

A Master of Professional Studies (MProfStuds) in Mathematics Education is designed for mathematics teachers who wish to reflect on and enhance their classroom practice through professional development, study and research.

The programme is tailored for teachers working part or full-time and can be taken part-time.

The degree brings together research, subject knowledge and professional experience to develop critical approaches to mathematics and statistics teaching and learning. The programme will allow students to explore research relevant to their mathematics teaching practice.

Students may be eligible for partial or full fees subsidies from their schools or the Ministry of Education, and scholarships from the University (see below), or the Auckland Mathematical Association (AMA).

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Career opportunities

Mathematics Education is essential for making sure mathematics is more widely understood and that students are inspired to pursue mathematical-based subjects and careers.

Graduates of this programme will be better equipped to be senior practitioners in mathematics and statistics education at primary, secondary or tertiary level, to lead the research-based professional development of mathematics teachers in their institution, and to take on positions of responsibility that involve mentoring other teaching staff.

Mathematics Education can also open up career opportunities in training in industry, policy making, research and many other fields.

Our graduates have been employed in the following jobs:

- Promotions for teachers within their schools (e.g. HODs, deputy principals)
- Professional Teaching Fellows
- Lecturers
- Professors
- Education policymakers

This subject is available in:

Master of Professional Studies

You may also be interested in our programmes in Mathematics, Education, Applied Mathematics and Psychology.

Find out more

about how your degree will be structured and what courses you need to take at

science.auckland.ac.nz/pg-maths-ed

“The University of Auckland is in the unique position of having the Mathematics Education Unit situated within the Mathematics department.”

Kaitlin Riegel

PhD Student in Mathematics Education.



Read Kaitlin's full story at:
science.auckland.ac.nz/kaitlin-riegel



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Tohu Paerunga Tauanga Hauora

Postgraduate Medical Statistics

Medical statisticians detect and monitor disease and evaluate treatments.

The main focus to this work is research, which sees medical statisticians design, implement and analyse clinical studies and present their findings in reports or publications. The role of a medical statistician is integral to public health education and policy making.

Courses available in this subject include:

- Epidemiology
- Introduction to Medical Statistics
- Design and Analysis of Clinical Trials
- Statistical Computing
- Longitudinal Data
- Stochastic Processes
- Bayesian Inference

Choosing your supervisor

Supervisors can usually only take a small number of students, so make sure you talk to them sooner rather than later.

Choose an area you feel passionate about. Undertaking research involves successes as well as challenges, so choosing a topic you are genuinely interested in will help you overcome challenges and get through the tough times.

Ensure you're compatible with your supervisor. Ask questions, seek advice and share your ideas with academic staff to find out their research interests, and whether you would be a good fit with their current projects.

Scholarships

You can apply for a range of scholarships when you apply for postgraduate study in Science.

science.auckland.ac.nz/scholarships



SCIENCE

No.1
New Zealand
University¹

No.1
In New Zealand
for Employability²

Career opportunities

In New Zealand most medical statisticians are employed by universities, hospitals, and district health boards, as well as the private sector in epidemiology, pharmaceutical and biotech industries.

Our graduates have excellent career prospects and are qualified for jobs across the field of medical statistics. With experience, medical statisticians can progress to independent consulting and to leadership roles.

Our graduates have been employed in the following jobs:

- Senior manager (biostatistics), Covance Pty Ltd
- Data analyst, Injury Prevention Research Center
- Biostatistician, LSK Global Pharma Service Co., Ltd

- Statistics advisor, Ministry of Health
- Seconded national expert, European Medicines Agency
- Statistician, University of California (Davis)
- Analyst, Compass Health
- Strategic reporting analyst, University of Auckland
- Research Fellow, Murdoch Children's Research Institute

This subject is available in:

Postgraduate Diploma in Science

Master of Science

You may also be interested in our programmes in applied mathematics, population health or mathematics and statistics.

Find out more

about how your degree will be structured and what courses you need to take at

science.auckland.ac.nz/pg-med-stats

"I want to be able to use statistical skills in a medical sense to be able to do research to help our society in public health."

Tegan Stone

Bachelor of Science (Honours) in Statistics with a focus on Medical Statistics.



Read Tegan's full story at:
science.auckland.ac.nz/tegan-stone



**Kuhua ki tō mātou
hapori, ā, Kimihia
tōu Pūtaiao.**

*Join our community
and find your Science.*

Applications close on 8 December.

Explore and discover



science.auckland.ac.nz/pg-med-stats

Have any questions?

Contact the Student Hub

auckland.ac.nz/student-hubs



Disclaimer: The information in this document is a general guide only for students and subject to alteration. All students enrolling at the University of Auckland must consult its official Calendar, to ensure that they are aware of and comply with all regulations, requirements and policies. [2023]

Tohu Paerunga Tauanga

Postgraduate Statistics

Statistics is the human side of the computer revolution, an information science, the art and science of extracting meaning from seemingly incomprehensible data. From designing an experiment to evaluate the effects of a new treatment for a disease, to analysing a set of data gathered by an ecologist – the diversity of applications of statistics is immense.

Statistics applies to almost any field, ranging from scientific research to business management and media analysis. As a postgraduate Statistics student you could explore topics like Bayesian statistics, bioinformatics, case control sampling and extension, experimental design and quality improvement, and operations research and stochastic processes, plus many more.

Courses available in this subject include:

- Advanced Statistical Programming with R
- Financial Mathematics
- Operations Research
- Probability Theory
- Professional Skills for Statisticians
- Statistical Computing

Choosing your supervisor

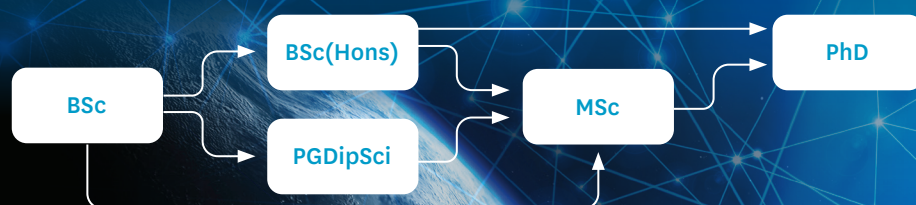
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Career opportunities

Statistics applies to almost any field and is the ideal partner course for people who want to enhance their quantitative capabilities while pursuing their career choice subject.

Training in statistics gives you an additional string to your bow that can help make you more effective in almost any profession, and will be essential if you wish to develop a career as a statistician.

With a postgraduate qualification in Statistics you will have excellent prospects and find employment in a wide range of industries, including banking, insurance companies, web-based and IT companies, market research organisations, pharmaceutical companies, public health and utility providers, Crown Research Institutes, government departments, universities and technical institutes.

Our graduates have been employed in the following jobs:

- Senior manager advanced analytics, PepsiCo
- Manager marketing analytics, Constellation Brands
- Web developer, Stack Overflow
- Statistician, The George Institute for Global Health
- Senior data administrator, New South Wales Health
- Chief Scientist, R Studio

This subject is available in:

Bachelor of Science (Honours)

Postgraduate Diploma in Science

Master of Science

Doctor of Philosophy

You may also be interested in our programmes in Applied Mathematics, Bioinformatics, Mathematics, Medical Statistics and Population Health.

Find out more

about how your degree will be structured and what courses you need to take at

science.auckland.ac.nz/pg-statistics



"I like how the content of the programme is constantly evolving. The statistics department maintains close connections with industry and the course content is optimised to teach the most in-demand and cutting-edge skills and demonstrate how they apply to real-world projects and datasets. This gave me confidence when facing real projects in the workplace."

Runzhe Gao

Master of Science in Statistics



Read Runzhe's full story at: auckland.ac.nz/science/runzhe-gao

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hāpori, ā, Kimihia
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