

# Statistics

Postgraduate Handbook 2018



THE UNIVERSITY OF  
**AUCKLAND**  
Te Whare Wānanga o Tāmaki Makaurau  
NEW ZEALAND

**SCIENCE**  
DEPARTMENT OF STATISTICS

# Welcome to the Department of Statistics

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Statistics and data science graduates have excellent career 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.

A postgraduate qualification in Statistics will be essential if you wish to develop a career as a statistician. Our department offers a wide selection of graduate courses, and the opportunity to develop research skills. If you decide you are interested in joining the postgraduate programme in Statistics at the University of Auckland, we would love to hear from you.

ILZE ZIEDINS  
Head of Department

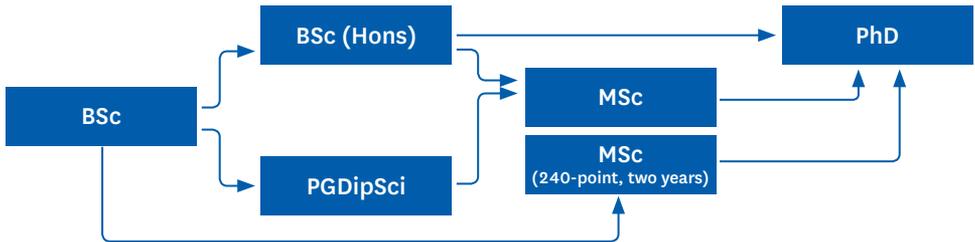
The University of Auckland has the  
**LARGEST\***  
statistics department  
in Australia and New Zealand 

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Birthplace of 

\*[www.science.auckland.ac.nz/excellence](http://www.science.auckland.ac.nz/excellence)

# Postgraduate study options in Statistics



## Bachelor of Science (Hons) in Statistics

### Prerequisites

- A bachelors degree with a major in Statistics or equivalent, with at least three Statistics courses above Stage II, and STATS 210 or STATS 225
- A grade point average (GPA) of at least 5.5 in 45 points above Stage II in Statistics, and a total of at least 90 points above Stage II

### Programme structure

- 30 points: STATS 781 Honours Project in Statistics
- 15 points: STATS 779, 782 or equivalent
- At least 45 points from STATS 701-787, BIOINF 704, POPLHLTH 707-709, 711
- Up to 30 points from 700-level courses in Statistics or related subjects, as approved by the Head of Department





## Postgraduate Diploma in Science (PGDipSci) majoring in Statistics

These one-year, full-time diplomas are designed for candidates who have a bachelors degree that includes a substantial amount of statistics, and who want a one-year postgraduate qualification with the option of a further year leading to a masters degree. Students also have the option of specialising in Medical Statistics – see our Medical Statistics handbook for more information.

### Prerequisites

- A bachelors degree majoring in Statistics or an equivalent, with at least three Statistics courses at Stage III or above, with GPA of at least 2.5 in all 300-level Statistics papers. STATS 210 (or STATS 225, or equivalent) is required.
- If your academic background does not satisfy this requirement, there are bridging options that you can discuss with a Graduate Officer for Statistics. Contact [office@stat.auckland.ac.nz](mailto:office@stat.auckland.ac.nz) for more information.

### Programme structure

- 15 points: STATS 779, 782 or equivalent
- At least 75 points from STATS 701-787, BIOINF 704, POPLHLTH 707-709, 711
- Up to 30 points from 700-level courses in Statistics or related subjects, as approved by the Head of Department

## Master of Science (MSc) in Statistics

An MSc in Statistics follows a PGDipSci or BSc(Hons) (or an equivalent), and can be done either as a taught masters or a research masters. For study options in Medical Statistics, please see our Medical Statistics Postgraduate Handbook.

### Prerequisites

- Students from the University of Auckland must have completed a PGDipSci, PGDipArts, BSc(Hons) or BA(Hons) in Statistics with a GPA of at least 4.0 for a taught masters, or a GPA of at least 5.5 for a research masters.
- Other students must have a comparable qualification.

### Programme structure

#### Research Masters

- 90 points: STATS 798 Masters Thesis in Statistics
- 30 points from 600 or 700-level courses in Statistics or related subjects, as approved by the Head of Department

#### Taught Masters

- 30 points: STATS 790 Masters Dissertation 1
- 15 points: STATS 732
- At least 45 points from STATS 701-787, BIOINF 704, POPLHLTH 707-709, 711
- Up to 30 points from 700-level courses in Statistics or related subjects, as approved by the Head of Department

It is possible to enter a 240-point MSc on completion of a bachelors degree with a major in Statistics, or equivalent. Please discuss this option with a Graduate Officer for Statistics.

[office@stat.auckland.ac.nz](mailto:office@stat.auckland.ac.nz)

## Doctor of Philosophy (PhD) in Statistics

A PhD in Statistics is intended to train students to be able to undertake research in statistics and its more advanced applications. The work done should result in the preparation of a thesis based on original research that makes a significant contribution to the area of specialisation.

We normally require a background in statistics with good supporting mathematics. However, we would also be very happy to consider other applicants with a background suited to any particular part of our research programme, for example, good mathematicians with less statistical knowledge, or good computer scientists with interests in statistical computing issues.

Some of our research students take PhDs in cross-disciplinary areas involving another subject (e.g. a medical discipline) and applied statistics. These PhDs typically have two supervisors, one from Statistics and one from another department of the University.

### Quick facts – BAS

**Points per degree:** 360 points

**Full-time study:** 3-4 years

**Part-time study:** 6-8 years

**Degree structure:** Research

**Application closing dates:** Apply at any time

**Start date:** Start at any time

For more information, go to  
[www.science.auckland.ac.nz/phd](http://www.science.auckland.ac.nz/phd)

*For a searchable database where you can find masters and doctoral supervisors and research projects that you can join, please visit [www.findathesis.auckland.ac.nz](http://www.findathesis.auckland.ac.nz)*

Postgraduate Statistics courses		
Course code	Title	Semester
STATS 701	Advanced SAS Programming	S1
STATS 705	Topics in Official Statistics	S2
STATS 707	Computational Introduction to Statistics	S1
STATS 710	Probability Theory	S1
STATS 721	Special Topic in Applied Probability	S2
STATS 722	Financial Mathematics	S2
STATS 723	Stochastic Methods in Finance	S1
STATS 726	Time Series	S2
STATS 727	Special Topic in Time Series	S2
STATS 730	Statistical Inference	S1
STATS 731	Bayesian Inference	S1
STATS 732	Introduction to Statistical Inference	S1
STATS 740	Sample Surveys	S1
STATS 741	Special Topic in Sampling	S1
STATS 747	Statistical Methods in Marketing	S2
STATS 750	Experimental Design	S1
STATS 760	A Survey of Modern Applied Statistics	S1
STATS 761	Mixed Models	S2
STATS 762	Special Topic in Regression	S1
STATS 766	Multivariate Analysis	S2
STATS 768	Longitudinal Data Analysis	S2
STATS 769	Advanced Data Science Practice	S2
STATS 770	Introduction to Medical Statistics	S1
STATS 773	Design and Analysis of Clinical Trials	S2
STATS 779	Professional Skills for Statisticians	S1
STATS 780	Statistical Consulting	S2
STATS 782	Statistical Computing	S2
STATS 784	Statistical Data Mining	S2
STATS 785	Topics in Statistical Data Management	SS, S2

For course description and more information, go to [www.stat.auckland.ac.nz/courses](http://www.stat.auckland.ac.nz/courses)

# Careers in Statistics

Statistics is the human side of the computer revolution, an information science, the art and science of extracting meaning from seemingly incomprehensible data. Statistics applies to almost any field. For this reason, many students find it complements their core area of interest or degree extraordinarily well, giving them an additional string to their bow that opens up new and exciting career opportunities.

Academic research

Actuary

Banking

Bioinformatics

Biology

Business analysis

Data scientist

Ecology

Education

Energy

Engineering

Finance

Government

Market research

Marketing

Medical statistics

Operations research

Organisational psychology

Policy development

Statistician (e.g. Biometrician)

School teacher

*"I chose to study at the University of Auckland because of the resources available for students, and the facilities."*

*"I love Statistics because of the deep knowledge I gain. My area of expertise is machine learning and data analysis, and I'm working on improving machine learning techniques. I hope to continue on to PhD study."*

*"The study environment here is awesome. I can easily access the online library for final exam preparation, and of course studies on the R language. The lecturers offer help when I need it, and there are many clubs and sports."*

*"I played basketball for the Faculty of Science in inter-faculty matches in 2015 and 2016 – I was really proud to be part of the team!"*

**Moshu Xie** is studying for a Postgraduate Diploma in Science specialising in Statistics.



# Helpful information

## Academic dates

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

## Accommodation

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

## Apply for postgraduate study

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

## Career Development and Employment Services

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

## Childcare

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

## Course advice and degree planning in Science

[www.science.auckland.ac.nz/student-centre](http://www.science.auckland.ac.nz/student-centre)

## Disability Services

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

## How to enrol

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

## Information for postgraduate students

[www.postgraduate.ac.nz](http://www.postgraduate.ac.nz)

## International students

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

## Libraries and Learning Services

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

## Māori and Pacific students

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

## Need help?

[www.askauckland.ac.nz](http://www.askauckland.ac.nz)

## Postgraduate Students' Association

[www.pgsa.org.nz](http://www.pgsa.org.nz)

## Rainbow Science Network for LGBTI students

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

## Scholarships and awards

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

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

## Support for students

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

**Questions about Statistics?  
office@stat.auckland.ac.nz**

## 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 alteration. All students enrolling at the University of Auckland must consult its official document, the University of Auckland Calendar, to ensure that they are aware of and comply with all regulations, requirements and policies.*



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Private Bag 92019, Auckland 1142, New Zealand

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Web: [www.stat.auckland.ac.nz](http://www.stat.auckland.ac.nz)



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[www.facebook.com/science.uoa](https://www.facebook.com/science.uoa)