

A hand is holding a tablet computer. The screen shows a data analytics dashboard with several line graphs and a bar chart. The background of the image is a blurred office setting. At the top, there is a decorative pattern of overlapping orange and yellow circles. A black rectangular box is positioned at the top center, containing the text 'AUT'. Below it, an orange rectangular box contains the text 'ANALYTICS'.

**AUT**

**ANALYTICS**

## ANALYTICS

Analytics has emerged as an important area of study. It links computing, mathematics and statistics to provide students interested in making significant contributions to business and industry, with the ideal quantitative background necessary for careers in these areas.

The AUT programme builds on its strong business and industry links, its reputation in the computing fields and its applied technology focus. Study analytics at AUT and you'll be exposed to the tools and techniques to provide analytical improvement in business performance.

As part of your studies you can also work on a research project involving applications of these techniques. You're encouraged to include related business electives, (eg economics or marketing) in your analytics degree.

Motivated graduates will be able to undertake postgraduate study in this field.

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## LEARNING OUTCOMES

- A sound understanding of the main body of knowledge in the component disciplines of analytics
- A sound knowledge of the theoretical basis for applications involving mathematics and computing in analytics
- The ability to understand, develop and implement effective models and algorithmic solutions to solve problems in analytics
- The ability to select appropriate statistical, mathematical and computational techniques in carrying out industrial and business data acquisition and analysis

### Year 1

Differential and Integral Calculus, Algebra and Discrete Mathematics, Programming, Applied Statistics, Mathematical Concepts, Applied Communications

### Year 2

- Logical Database Design, Statistical Methods, Forecasting, Probability
- Plus additional selective papers from the Bachelor of Mathematical Sciences or Bachelor of Science

### Year 3

- Statistical Computing with SAS, Industrial and Business Analytics, Applied Stochastic Models, Statistical Modelling, Data Mining & Knowledge Engineering, Individual Research Project
  - Plus additional selected papers from the Bachelor of Mathematical Sciences or Bachelor of Science
  - You're encouraged to consider taking electives involving business subjects.
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## CONTENTS OF THE PROGRAMME

### Level 6 papers

#### Logical Database Design

Provide an in-depth understanding of data modelling concepts along with an introduction to database management systems. The paper explains how databases are used in business organisations.

Students will get practical experience as well as theory in the design and implementation of small business database systems.

#### Statistical Methods

Extends the standard statistical methods introduced in Applied Statistics. Extra topics include power calculations, a range of experimental designs, non-parametric methods, non-linear regression and clinical methods.

#### Forecasting

Patterns in time series are discovered and models that attempt to explain past behaviour and predict future behaviour are formulated. Software is used as an aid in the identification, estimation, forecasting and diagnostic phases of the model building process.

#### Probability

Provides an introduction to a branch of statistics that deals with the study of chance. Delivers access to a range of techniques for modelling and analysing in real-life settings.

## Level 7 papers

### **Applied Stochastic Models**

The focus of this paper is the application of scholastic models to analyse real-life scenarios. Key stochastic processes are studied via their mathematical properties and simulation. Models are fitted to data taken from a range of applications.

### **Data Mining and Knowledge Engineering**

Provides an introduction to the exciting world of data mining. Organisations have, over time, accumulated vast amounts of valuable data which, when exploited appropriately will give them a significant competitive advantage over their rivals who merely “crunch” data. Data mining is an area that has come of age – well proven techniques and tools are widely available. This paper covers popular mining techniques as well as providing specific hands-on experience using a publicly available tool.

### **Statistical Computing with SAS**

Provides students with an understanding and the application of statistical computing software SAS.

In particular, students will gain experience in choosing the appropriate analysis for a variety of applied statistics situations. Data will be analysed from a range of areas, including engineering, the social sciences, the environmental sciences and business.

### **Industrial and Business Analytics**

Prepares the student as an applied statistician for the workplace by developing skills in experimental design, the collection and analysis of data, the application of statistical modelling concepts in industrial contexts, and advanced analysing techniques.

### **Statistical Modelling**

In this paper, students will learn about the properties of random variables and the theoretical concepts underpinning statistical models. Software will be used to numerically verify key theoretical results. Content includes the transformations of random variables, multivariate random variables (discrete and continuous), sums of random variables and moment generating functions, order statistics, sampling distributions, estimation (method of moments, maximum likelihood estimation, least squares) and the application of statistical models.

## ENTRY REQUIREMENTS

You need University Entrance (or equivalent). Preference will be given to applicants with one or more level 3 subjects from Calculus, Mathematics or Statistics. Students who do not have the above background may be directed to take certain papers in their first year of study.

An interview may be required.

## WHEN TO APPLY

Apply before December for Semester 1 and before June for Semester 2. Late applications will be considered subject to space availability.

## APPLY ONLINE

<https://register.aut.ac.nz/>

## WHAT IF I ALREADY HAVE A BACHELOR'S DEGREE?


If you already have a degree in another discipline you can enrol in a Graduate Certificate in Mathematical Sciences/Graduate Certificate in Science or a Graduate Diploma in Mathematical Sciences/Graduate Diploma in Science. You may also be able to apply for our Master of Analytics (1.5 years full-time, part-time study options available).




## MORE INFORMATION


### Student Hub

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