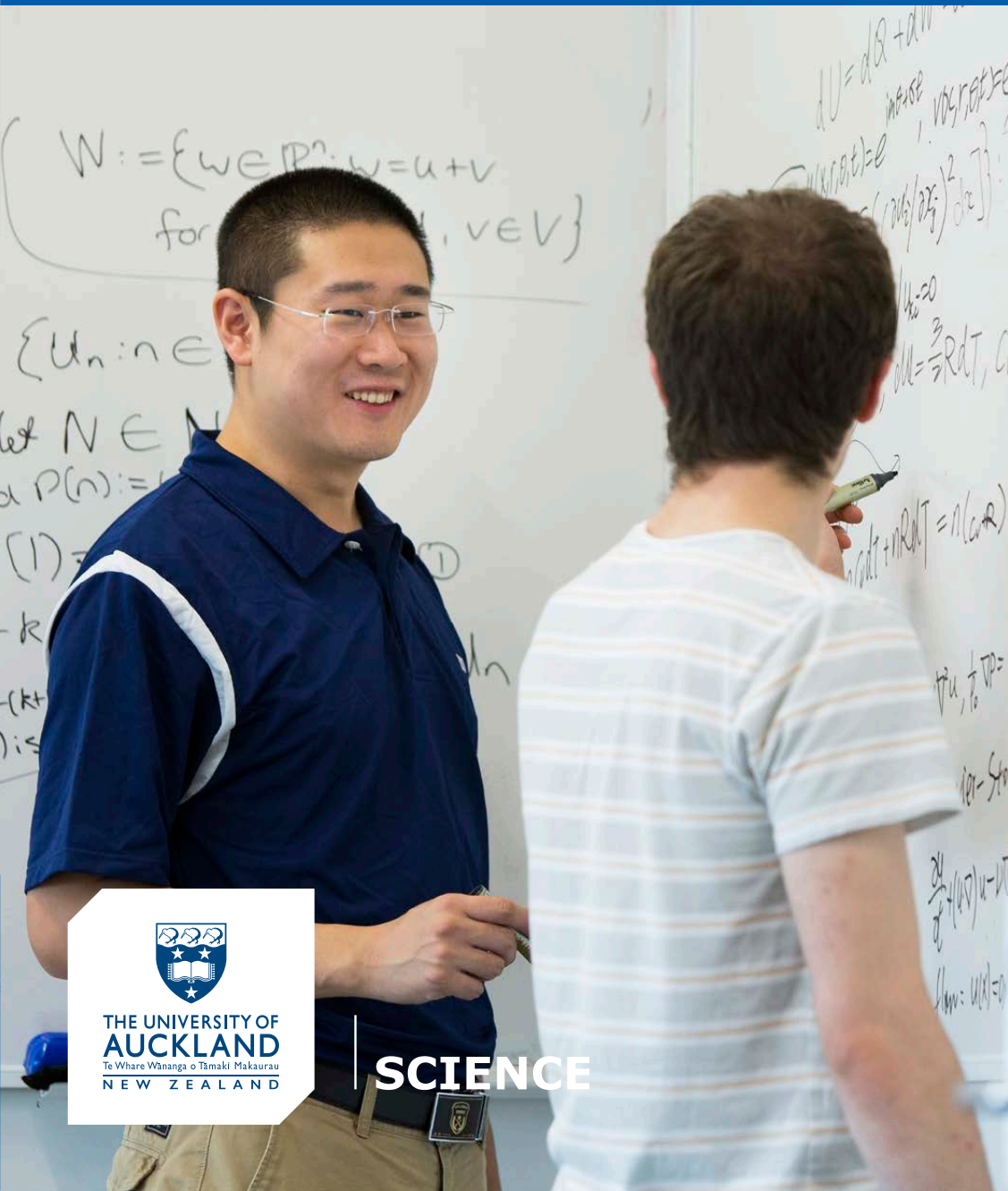
MATHEMATICS

UNDERGRADUATE HANDBOOK

2017



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

SCIENCE

Welcome to the Department of Mathematics

Mathematics and Applied Mathematics are powerful and versatile degrees - almost every sphere of knowledge and activity in the modern world relies on mathematics, because it is the language through which nature, technology and reality are described.

The Department of Mathematics is one of the largest and most diverse departments within the University of Auckland, covering Both Pure and Applied Mathematics and Mathematics Education. It has an excellent international reputation and offers degrees and diplomas that enjoy widespread recognition from employers in New Zealand and internationally.

You can study Mathematics or Applied Mathematics in combination with a wide range of other subjects, especially in the Faculties of Arts, Science, Engineering and the Business School for the degrees of BA, BCom, BE or BSc.

Graduates of this University will need to apply their skills to solve complex problems in an ever-changing world. Mathematics and Applied Mathematics play fundamental roles in providing the skills and framework needed to tackle such challenges.

Mathematics and Applied Mathematics are also ideal supporting subjects for many other disciplines. Your future prospects and employability in other fields are enhanced by significant mathematical content in your degree. Graduates from the department take up positions in business, industry, planning and environmental organisations, and a wide range of other areas.

BERND KRAUSKOPF
Head of Department

Our department is ranked in the top 100

QS World University Rankings by subject 2016

TOP 100 in the world

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Mathematics

www.science.auckland.ac.nz/excellence

Bachelor of Science in Mathematics

Mathematics is a fundamental discipline that has been a part of the human search for understanding for more than two thousand years. In the beautiful and powerful world of mathematics, universal truths exist, waiting to be uncovered. By studying mathematics you gain increased analytical ability, comprehension of abstract concepts and creative thinking. These skills are highly valued in the business, financial, industrial, social and academic worlds.

Students looking to broaden their knowledge and expand their career options after they graduate should consider partnering maths with another field of study - either as a conjoint, or a double major in a science degree. Visit **www.math.auckland.ac.nz/perfect-match**.

3 The average number of years it takes to complete a Bachelor of Science degree

You can choose either a single or double major

Preparation for school leavers

Students will be selected on the basis of their rank score. There are no required subjects for entry into Mathematics, however, it is strongly advised that students take Calculus in school.

It is important that you choose the mathematics courses that are right for you. To help you choose your first mathematics course, visit **www.math.auckland.ac.nz/stage1-faq**

For course planning and enrolment, go to **www.science.auckland.ac.nz/student-centre**

Thinking about postgraduate study options? **Visit www.math.auckland.ac.nz/pg**

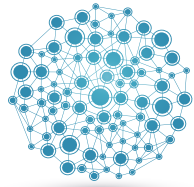
Complementary majors

The numerical and analytical skills you develop by studying mathematics can be applied across all scientific fields of study, making mathematics the perfect match for all other majors in science.

MATHEMATICS +

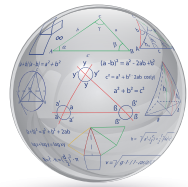
- Applied Mathematics
- Computer Science
- Information Systems
- Logic and Computation
- Physics
- Statistics

www.science.auckland.ac.nz/doublemajors



Statistics

+



Mathematics

Planning your major in Mathematics

BSc

Year 1

MATHS 150	MATHS 250*						

With appropriate prerequisites can also be filled by Stage II or III.

**It is recommended that students take MATHS 250 in their first year of study if possible*

Year 2

MATHS 253, 255, 260	MATHS 253, 255, 260						GEN ED

Stage II

Any Stage

Note: MATHS 108/110 and 208 can also count toward your BSc, however these courses were designed for other majors and are not intended for Mathmatics majors.

Year 3

MATHS 302-353	MATHS 302-353	STAGE III ELECTIVE	STAGE III ELECTIVE				GEN ED

Stage III Elective: Any MATHS 302-363, STATS 310, 325, 370, ENGSCI 391, PHIL 305

Stage III Science

Stage II or III Science

**Stage III courses can be taken at any stage once the prerequisite courses are completed, subject to timetabling*

1. Courses in a minimum of three subjects listed in the BSc Schedule.
2. At least 180 points (12 courses) must be above Stage 1.
3. Up to 30 points (2 courses) may be taken from outside the Faculty.
4. 30 points (2 courses) must be taken from the appropriate General Education Schedules for BSc students.
5. At least 75 points must be at Stage III, of which 60 points must be in the majoring subject.

To view regulations for majors, and course descriptions, see www.calendar.auckland.ac.nz

BSc degree requires: 360 points (24 x 15 point courses). Each box represents one 15 point course.

It is recommended that students enrol in 8 courses each year.

Undergraduate Mathematics Courses

Stage I

MATHS 102: Functioning in Mathematics
MATHS 108: General Mathematics 1
MATHS 110: Mathematics for Science
MATHS 150: Advancing Mathematics 1
MATHS 162: Computational Mathematics
MATHS 190/MATHS 190G: Great Ideas Shaping Our World
SCIGEN 101/101G: Communicating for a Knowledge Society
MATHS 153: Accelerated Mathematics (Young Scholars Programme)

Stage II

MATHS 202: Tutoring in Mathematics
MATHS 208: General Mathematics 2
MATHS 250: Advancing Mathematics 2
MATHS 253: Advancing Mathematics 3
MATHS 255: Principles of Mathematics
MATHS 260: Differential Equations
MATHS 270: Numerical Computation
COMPSCI 225: Discrete structures in Mathematics and Computer Science

Stage III

MATHS 302: Teaching and Learning Mathematics
MATHS 315: Mathematical Logic
MATHS 320: Algebraic Structures
MATHS 326: Combinatorics
MATHS 328: Algebra and Applications
MATHS 332: Real Analysis
MATHS 333: Analysis in Higher Dimensions *(not offered in 2017)*
MATHS 340: Real and Complex Calculus
MATHS 361: Partial Differential Equations
MATHS 362: Methods in Applied Mathematics
MATHS 363: Advanced Modelling and Computation
STATS 370: Financial Mathematics

For course descriptions and prerequisite information, go to www.math.auckland.ac.nz/ugcourses

Careers in Mathematics and Applied Mathematics

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.

"My favourite subjects in high school were always maths and statistics, which is why I chose to continue studying them (along with finance) when I came to the University of Auckland.

"I also know that the numerical, analytical, and problem solving skills that you learn in these subjects are important skills for any sort of professional career, which keeps my options wide open for when I finish university."

***Vera Clarkson** has recently completed her BCom/ Bsc conjoint degree, majoring in Maths, Statistics and Finance. She was also a Tuakana mentor for Maths and Statistics.*

Academia and research
Actuarial and business analysis
Biostatistics and biotechnology
Data science
Government (IRD, Defence, Security Intelligence etc)
Economic analysis
Information systems and technology
Financial services (Banks, Investment Funds, Insurance etc)
Modelling (Engineering, Industry, Logistics, Meteorology and many other areas)
Operations research
Risk management
Software development (Programming, AI, Robotics etc)
Statistical analysis
Sustainability analysis
Teaching
Telecommunications industry

*Meet **John Holt**, his background includes a BSc, MSc and PhD in Mathematics.*

Helpful information

Academic dates	www.auckland.ac.nz/dates
Academic Integrity Course	www.auckland.ac.nz/academic-integrity
Accommodation	www.accomodation.auckland.ac.nz
Buy coursebooks	www.science.auckland.ac.nz/resource-centre
Career Development and Employment Services	www.auckland.ac.nz/careers
Course advice and degree planning in Science	www.science.auckland.ac.nz/student-centre
General education	www.auckland.ac.nz/generaleducation
How to apply	www.apply.auckland.ac.nz
How to enrol	www.auckland.ac.nz/enrolment
International students	www.international.auckland.ac.nz
Māori and Pacific students	www.science.auckland.ac.nz/tuakana
Need help?	www.askauckland.ac.nz
Rainbow Science Network for LGBTI students	www.science.auckland.ac.nz/rainbowscience
Scholarships and awards	www.scholarships.auckland.ac.nz
Support for students	www.science.auckland.ac.nz/support

Applications close on December 8 for Semester 1 or December 1 for Summer School.

Questions about Mathematics? Email ugadvice@math.auckland.ac.nz

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

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