

Mathematics

Undergraduate Handbook 2018



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

SCIENCE

DEPARTMENT OF MATHEMATICS

Welcome to the Department of Mathematics

Mathematics is a powerful and versatile degree – 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 Pure Mathematics, 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 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 plays a fundamental role in providing the skills and framework needed to tackle such challenges.

Mathematics is also an ideal supporting subject 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

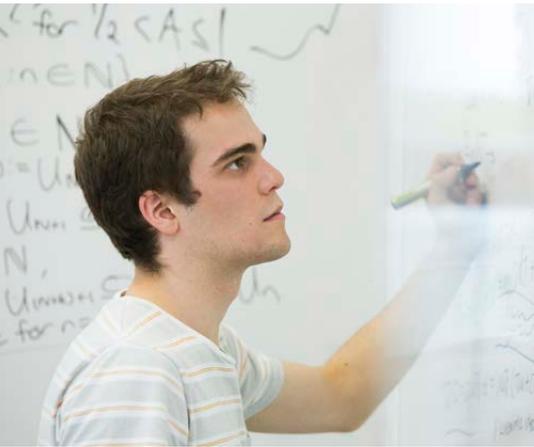
**Our subject
is ranked in
the top 100
worldwide**

QS World University
Rankings by subject 2017



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, your analytical abilities, comprehension of abstract concepts, and creative thinking skills will improve. 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 Mathematics with another field of study – either as a conjoint, or a double major in a science degree.

www.math.auckland.ac.nz/perfect-match

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, we strongly advise that students take calculus (at NCEA level 3, or equivalent) 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

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

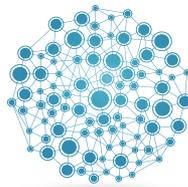
Information Systems

Logic and Computation

Physics

Statistics

www.science.auckland.ac.nz/doublemajors



Statistics



Mathematics

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

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

BSc degree planner – Mathematics

BSc

Year 1

MATHS 150	MATHS 250*						
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With appropriate prerequisites can also be filled by Stage II or III.

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

*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
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*All students majoring in Mathematics are encouraged to take MATHS 253, 255 and 260

Any Stage

Year 3

MATHS 302-360	MATHS 302-360	STAGE III ELECTIVE	STAGE III ELECTIVE					GEN ED
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Stage III Science

Stage II or III Science

1. Courses in a minimum of three subjects listed in the BSc Schedule
2. At least 180 points (12 courses) must be above Stage I
3. Up to 30 points (two courses) may be taken from outside the faculty
4. 30 points (two 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

It is the student's responsibility to check that the final programme complies with University Regulations. The Faculty of Science is the final authority on all BSc regulations.

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.
We recommend that students enrol in eight courses each year.

Degree Planners for double majors can be found at www.science.auckland.ac.nz/course-planning

Undergraduate Mathematics Courses	
Course Code	Title
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	Learning Mathematics through Teaching
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	Perspectives in Mathematics Education
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
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

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

- Academia and research
- Actuarial and business analysis
- Biostatistics and biotechnology
- Data science
- Government (IRD, Defence, Security Intelligence)
- Economic analysis
- Information systems and technology
- Financial services (banks, investment funds, insurance)
- Modelling (engineering, industry, logistics, meteorology and many other areas)
- Operations research
- Risk management
- Software development (programming, artificial intelligence, robotics)
- Statistical analysis
- Sustainability analysis
- Teaching
- Telecommunications industry

Morgan Meertens is studying for a Bachelor of Science/Bachelor of Engineering conjoint, majoring in Mathematics and Engineering Science.

“At high school I loved mathematics and because I was unsure of what pathway I wanted to follow, I decided to study a conjoint degree.

“Doing a conjoint gives me options to do what I enjoy in the future. Learning new topics and gaining new experiences opens you up to things that you may not have known existed.

“I really enjoyed my summer research project, which was about the effects of solar radiation on the Earth’s climate. It’s opened up possibilities for me, and now I would like to pursue a postgraduate degree in Science.

“When I began University I was very nervous and shy. At first I held back from going to Tuākana tutorials when I had questions, even though I am of Pacific descent and that is who Tuākana is for.

“A couple of years ago I was asked to become a tutor for Tuākana students. Being a tutor has helped me to grow and become more confident with other students, especially in Tuākana where everyone is so welcoming.

“It’s been great making friends who study the same thing, as when I’m stuck, I can turn to them and I know they will help.”



Helpful information

Academic dates

www.auckland.ac.nz/dates

Academic Integrity Course

www.auckland.ac.nz/academic-integrity

Accommodation

www.accommodation.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/rainbowsience

Scholarships and awards

www.scholarships.auckland.ac.nz

Support for students

www.science.auckland.ac.nz/support



Hear from some of our Mathematics graduates and see what exciting careers paths they're following.

www.math.auckland.ac.nz/graduates

**APPLICATIONS CLOSE ON
8 DECEMBER FOR SEMESTER 1 OR
1 DECEMBER FOR SUMMER SCHOOL.**

**Questions about Mathematics?
ugadvice@math.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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