

APPLIED 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**



Bachelor of Science in Applied Mathematics

Applied Mathematics provides you with the skills to develop theory and methods that investigate and explain phenomena in the world around us, including in science, engineering, business and industry.

Mathematics and Applied Mathematics interact with other disciplines and make essential contributions to science, engineering, medicine and commerce, as well as to many important contemporary areas of technology such as communication, linguistics, genetics and climate science.

Wherever problems need to be solved, mathematics has a role to play. In fact, many sciences rely so heavily on mathematics that their most important questions are, fundamentally, mathematical.

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 Applied 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



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.

APPLIED MATHEMATICS +

Computer Science

Information Systems

Logic and Computation

Mathematics

Physics

Statistics

www.science.auckland.ac.nz/doublemajors

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

Planning your major in Applied Mathematics

BSc

Year 1

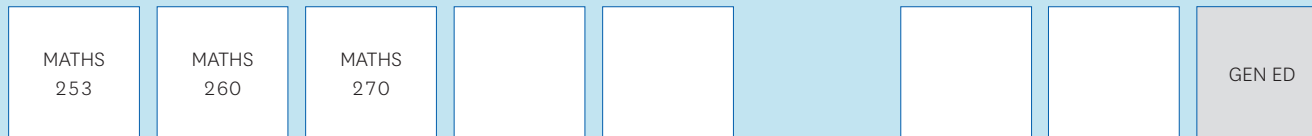


With appropriate prerequisites can also be filled by Stage II or III.

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 Mathematics majors.

**It is recommended that students take MATHS250 in their first year of study if possible.*

Year 2



Stage II

Any Stage

Year 3



Stage III Science

Stage II or III Science

Any Stage

Stage III Elective: 15 points from MATHS 332, 333, 362, STATS 310, 325, 370, ENGSCI 343, 391

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 background in Applied Maths from the University of Auckland has given me a methodical approach to problem solving that employers really value. In my position at Compac I use the algorithms and code writing skills I developed as a student on a daily basis, and use them to help solve real world problems – something I never knew maths could be used for when I was a teenager."

Kate O Byrne completed a PhD in Applied Mathematics.

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.

- 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.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

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

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



Connect with us

Faculty of Science, The University of Auckland
Private Bag 92019, Auckland 1142, New Zealand

Phone: 0800 61 62 63 | Email: scifac@auckland.ac.nz

Web: www.math.auckland.ac.nz



twitter.com/ScienceUoA



www.facebook.com/science.uoa

