Welcome to the Department of Mathematics

We extend a warm invitation to all qualified students to consider studying for a postgraduate degree or diploma in Mathematics at the University of Auckland.

If you enjoyed your experience as an undergraduate student in Mathematics or Applied Mathematics and would like to enhance your skills and get a taste of cutting-edge research, you should consider pursuing postgraduate studies.

As a postgraduate studying Mathematics or Applied Mathematics, you can specialise in an area of your choice and develop your studies in depth. The department offers four postgraduate programmes – honours degrees (Bachelor of Science or Arts honours), masters degrees (Master of Science or Arts), a Postgraduate Diploma in Science, and a PhD programme.

A postgraduate qualification will provide you with advanced knowledge in Mathematics or Applied Mathematics. The experience of writing a dissertation or thesis provides skills that are in demand by many employers. Graduates from the department take up positions in business, government, industry, research, planning and environmental organisations.

We will be pleased to welcome you as a postgraduate student in our department.

BERND KRAUSKOPF
Head of Department

Our subject is ranked in the top 100 worldwide

QS World University Rankings by subject 2017
Postgraduate study options in Mathematics

Why study Mathematics?
A postgraduate degree in Mathematics or Applied Mathematics can help you increase your level of knowledge and understanding across a broader and deeper range of topics. It can help you improve and intensify your range of abilities, such as in modelling, computation, and problem-solving, and develop your intuition. The programmes on offer give you an opportunity to learn about research, conduct your own research, make new discoveries and develop new ways of looking at things. They can also give you an exciting and rewarding experience of presenting your new findings. These are highly valuable personal skills that can open up new career opportunities, and enhance your earning potential in the modern world.

Graduate Diploma in Science (GradDipSci)
This is a one-year diploma that can provide an undergraduate major in Mathematics or Applied Mathematics for students who have a degree without such a major.

For more information and advice contact: honsadvice@math.auckland.ac.nz
Bachelor of Science (Honours) – Mathematics or Applied Mathematics
Bachelor of Arts (Honours) – Mathematics

**Prerequisites**
- For the Bachelor of Science (Honours): Bachelor of Science majoring in Mathematics or Applied Mathematics
- For the Bachelor of Arts (Honours): Bachelor of Arts majoring in Mathematics
- Completed compulsory undergraduate courses
  - Mathematics – MATHS 332 and either MATHS 320 or MATHS 328 (or equivalent)
    Mathematics Education students may substitute MATHS 302 for one of these courses (BSc(Hons) only) OR MATHS 340, 361 and 363 (BA(Hons) only)
  - Applied Mathematics – MATHS 340 and MATHS 361 (or equivalent)
- Gained a GPA of at least 5.0 over 45 points above Stage II in Mathematics
- Passed at least another 45 points in courses above Stage II in any subject (BSc(Hons) only)

**Programme structure**
This is a one-year degree which may also be taken part-time over two years.

**Mathematics**
- 30 points: MATHS 776 (Dissertation) and either
  - 90 points in 700-level Mathematics courses
  - At least 45 points in 700-level Mathematics courses and up to 45 points from 700-level courses in a related subject, with approval of the Head of Department

**Applied Mathematics**
- 30 points: MATHS 776 (Dissertation)
- At least 45 points from MATHS 761-770, PHYSICS 701, 707
- Up to 45 points from approved 700-level courses in Mathematics or related subjects with approval of the Head of Department

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For more information and advice contact: honsadvice@math.acukland.ac.nz or visit www.math.auckland.ac.nz/hons-pgdipsci
Postgraduate Diploma in Science (PGDipSci)

Prerequisites
A Bachelor of Science majoring in Mathematics (including MATHS 332 and either MATHS 320 or MATHS 328), Mathematics Education students may substitute MATHS 302 for one of these courses; or a major in Applied Mathematics.

Programme structure
This is a one-year diploma which may also be taken part-time, over four years or less.

Mathematics
- At least 75 points in 700-level Mathematics courses
- Up to 45 points from approved 600 or 700-level courses in Mathematics or related subjects, with the approval of the Head of Department

Applied Mathematics
- At least 60 points from MATHS 761-770, PHYSICS 701, 707
- Up to 60 points from approved 700-level courses in Mathematics or related subjects with approval of the Head of Department

For more information and advice contact: honsadvice@math.auckland.ac.nz or visit www.math.auckland.ac.nz/hons-pgdipsci
Master of Science (MSc) – Mathematics or Applied Mathematics
Master of Arts (MA) – Mathematics

The masters programme can be taken as either a 120-point degree after completing an honours degree or as a 240-point degree straight after a bachelors degree.

Prerequisites

MSc 120 points
- BSc(Hons) or PGDipSci in Mathematics or Applied Mathematics
- At least a GPA of 4.0 in 90 points taken for the BSc(Hons) or PGDipSci (for the PGDipSci, at least 75 points must be at 700-level or from a dissertation)

MSc 240 points
- BSc in Mathematics or Applied Mathematics
- A GPA of at least 5.0 in 75 points above Stage II, including at least 45 points in the relevant subject major

MA 120 points
- BA(Hons) or PGDipArts in Mathematics
- A GPA of at least 5.0 over the programme

MA 240 points
- BA in Mathematics
- A GPA of at least 5.0 in 45 points above Stage II
- Completed MATHS 332 and either MATHS 320 or 328

or
- Completed MATHS 340, 361 and either MATHS 362 or 363

Programme structure

Mathematics 120 points (MSc and MA)
This is a one-year degree which may also be taken part-time over two years.
- 120-point thesis: MATHS 796
or
- 90 point research portfolio: MATHS 798
- 30 points from MATHS 701-789, or approved 700-level courses in related subjects with the approval of the Head of Department

Applied Mathematics 120 points (MSc)
This is a one-year degree which may also be taken part-time over two years.
- 120-point thesis: MATHS 795

Mathematics 240 points (MSc)
This is a two-year degree which may also be taken part-time over four years.
- At least 75 points in 700-level Mathematics courses
- Up to 45 points from approved 700-level courses in Mathematics or related subjects, with the approval of the Head of Department

and either
- 120 points: MATHS 796 Thesis in Mathematics
or
- 90 points: MATHS 798 Research Portfolio in Mathematics

30 points from MATHS 701-789, 792-797 or 700-level courses in related subjects as approved by the Head of Department
Mathematics 240 points (MA)
This is a two-year degree which may also be taken part-time over four years.

- 120 points from MATHS 701-770, 777, 781-789, 792-794 or approved 700-level courses in related subjects, with the approval of the Head of Department
- 120 points: MATHS 796 Thesis

or
- 90 points: MATHS 798 Research Portfolio
- 150 points from MATHS 701-770, 777, 781-789, 792-794 or approved 700-level courses in related subjects, with the approval of the Head of Department

Applied Mathematics 240 credit points (MSc)
This is a two-year degree which may also be taken part-time over four years.

- At least 60 points from MATHS 761-770, PHYSICS 701, 707
- Up to 60 points from approved 700-level courses in Mathematics or related subjects, with approval of the Head of Department
- 120 points: MATHS 795 MSc Thesis in Applied Mathematics

Before you can enrol into either an MSc or MA you must receive departmental approval. This will require you to have found a research project and a qualified staff member who is willing to supervise you.

For more information and advice contact: pgadvice@math.auckland.ac.nz or visit www.math.auckland.ac.nz/masters
“After completing honours and masters, I realised that what I really wanted to do was to be of help to society. I knew that studying for a PhD at the University of Auckland, amongst some of the leading mathematicians in the world, would prepare me for this.

“Having completed my undergraduate, honours and masters degrees here, I knew that studying for my PhD would equip me with the skills to help create new or enhanced technology in the medical field, or enhance the buildings in earthquake prone zones.

“I’m studying geostatistics and mathematics, and my thesis is on inverse problems and fracture models. I love knowing that what I’m studying now can be applied to the real world and that I am working on something that can actually be of help to society.

“Throughout my five years of study at the University, I’ve always felt that the lecturers here are so passionate about what they do and really care for their students. Whenever I’ve been stuck, they have always been there to support me.”

Lia Ji Soo Lee is studying for a PhD specialising in Mathematics.
Doctor of Philosophy (PhD)

Quick facts
- 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

Entry to PhD
Entry into the PhD programme requires a relevant BSc(Hons) degree with first class or second class (division 1) honours or an MSc degree with first or second class honours from a recognised institution. It is normally expected that this preparation includes a strand of research.

Opportunities for our Postgraduate students
Our postgraduate students are encouraged to interact fully with the department. As a postgraduate student you will be encouraged to attend and participate in:
- Faculty of Science postgraduate poster competitions
- Annual Mathematics Student Research Conference
- Subject-specific seminars
- Departmental colloquia
- Public lectures
- Departmental functions
- Attend conferences (PhD students can apply for departmental funding)

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

For more information and advice contact: phdadvice@math.auckland.ac.nz or visit www.math.auckland.ac.nz/phd

Tutoring and marking
Enrolled students can apply to be employed as a tutor or marker for the department.
Enquiries should go to markers-tutors@math.auckland.ac.nz
Postgraduate Mathematics courses 2018

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<tr>
<th>Course code</th>
<th>Title</th>
<th>Semester</th>
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<tbody>
<tr>
<td>708</td>
<td>Special Topic: Mathematical Task Design</td>
<td>S1</td>
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<td>709</td>
<td>Special Topic: Mathematical Knowledge for Teaching</td>
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<td>720</td>
<td>Group Theory</td>
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<td>721</td>
<td>Representations and Structure of Algebras and Groups</td>
<td>S2</td>
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<tr>
<td>730</td>
<td>Measure Theory and Integration</td>
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<td>731</td>
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<td>735</td>
<td>Analysis on Manifolds and Differential Geometry</td>
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<td>761</td>
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<td>Stochastic Differential and Difference Equations</td>
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<tr>
<td>770</td>
<td>Advanced Numerical Analysis</td>
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For course descriptions and prerequisite information, go to www.math.auckland.ac.nz/pgcourses

Our research programmes are designed to take students to the cutting edge of their discipline. Postgraduate courses are taught by staff who are active researchers, and who supervise student self-directed projects, dissertations and theses.

Research staff in the department offer a broad range of honours dissertation and masters research topics in Mathematics, Applied Mathematics as well as Mathematics Education.

A list of proposed research topics is available online www.math.auckland.ac.nz/pgprojects
“I have always enjoyed maths, and after taking a BSc in Maths and Stats at Auckland I chose to continue my studies and do an honours year.

“My research is in lattice cryptography, which includes studying the structure of lattices (discrete mathematical objects) and their applications in cryptosystems and secret sharing.

“The rest of my degree involves studying pure maths topics such as number theory, group theory, analysis and algebra.

“My favourite thing about my programme is the interaction we have with our lecturers. Since most of our classes are quite small by this stage, our lectures are more personalised, which allows us to feel more comfortable when asking questions about the course, or our studies in general.

“I’m currently receiving the Honours Scholarship, which provides me with funding for both my fees and living expenses throughout my honours year. This has helped immensely, as it allows me to focus more on my studies, and was a great influence in my decision to stay at Auckland for my honours year.”

**Daniel Hughes** is studying for a Bachelor of Science (Honours) specialising in 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.