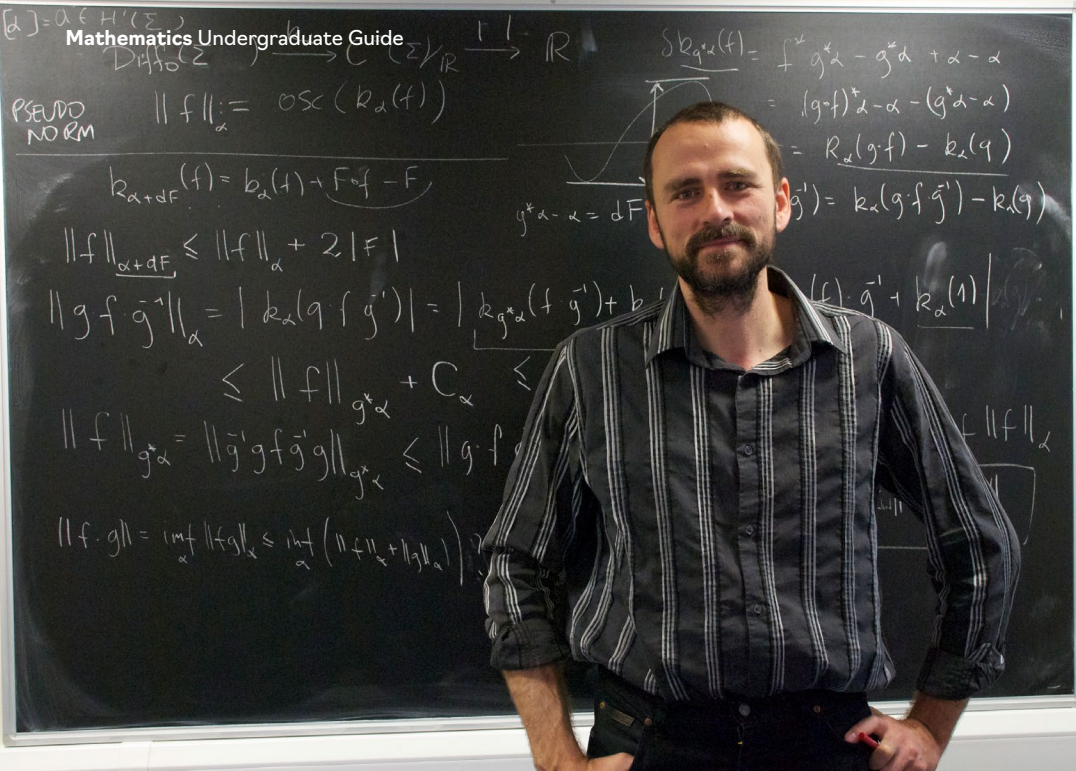


GO BEYOND BOUNDARIES

Mathematics

UNDERGRADUATE GUIDE



Mathematics is a major intellectual subject which is as old as human history. It has its roots in the systematic development of methods to solve practical problems and the realisation that such methods, when stripped of the details of the particular situation, could be applied to a wide range of seemingly different problems.

Thus, abstraction became an important feature of mathematics, distinguishing it from all other sciences, and leading to the development of subjects such as algebra, calculus, combinatorics, geometry and others, all of which are taught in Aberdeen.

The abstract study of mathematics is in itself an intellectual pursuit of value, opening up a world which contains excitement and beauty. Equally exciting is the evolution of mathematics side by side with human society.

Nowadays mathematics underpins how the internet works and is fundamental to all modern technology including engineering and medicine.

Why study at Aberdeen?

Mathematics is not just about crunching numbers – it's about logical thinking, solving problems, decision making and understanding why things work – the main skills that recruiters look for in potential employees. Mathematicians are in high demand across a range of sectors, including IT, finance, engineering and teaching.

At Aberdeen, we build on the mathematical methods you have learned at school to explore topics such as group theory (the mathematical study of symmetry), ring theory (which underpins cryptography), and topology (the property of shapes, which has applications to data analysis, robotics and neuroscience).

Employers are keen to recruit our graduates due to their ability to think logically and analyse new developments and opportunities in the world of business, finance and technology.

Mathematics is also vital to the physical sciences, engineering and life sciences, as it is the essential tool with which scientists formulate theories and their consequences.

Maths Society

The Aberdeen University Maths Society is a fun and friendly student-run society for maths enthusiasts and friends, that organises regular social and mathematical activities. Find out more about the Maths Society on Facebook at: www.facebook.com/AUmathssociety

Degree Programmes

Single Honours:

- BSc Applied Mathematics
- MA Applied Mathematics
- BSc Mathematics
- MA Mathematics

Joint Honours:

- BSc Computing Science and Mathematics
- BSc Mathematics and Physics
- MA Business Management and Mathematics
- MA Economics and Mathematics
- MA German and Mathematics
- MA Mathematics and Philosophy
- MA Mathematics and Spanish & Latin American Studies
- Minor-Major Honours Degrees
- BSc Mathematics with Gaelic
- MA Mathematics with Gaelic

Find out more:

www.abdn.ac.uk/ug/mathematics

What our students say



Helen Taylor
BSc Mathematics



During my time studying, I developed a good relationship with both the staff and my classmates. The lecturers at the department were always friendly and happy to answer any questions outside of their teaching hours. The class sizes were not too large, and as such the lecturers would make an effort to know each student by name - something that would not be possible in larger groups. One of my optional courses in fourth year was called Knots, which stands out from the other courses when I look back due to the inverted-classroom teaching style that was adopted, making the class more interactive for the students. My favourite part of studying maths was my involvement with the maths society, which was a relatively new society at the time. As well as hosting weekly maths talks, the society also held a variety of social events such as movie night and bowling trips. I would highly recommend the programme, as the maths department allows you to form good relationships with your peers, as well as your lecturers. A degree in mathematics is highly versatile, not only because of the knowledge that you gain, but because of the problem solving skills you will develop during your degree.



Facundo Manuel Canale
MA Mathematics



I have learnt the basics of the main branches of mathematics, and I have had the chance to focus on the parts that I am more interested in. Also, in the last year of my degree I was given the chance to teach tutorials students from years below me. This was a fantastic experience which will definitely boost my chances of getting into a more competitive research programme next year. The staff at the department are much more involved with the students than just teaching. They are always happy to give you a hand with anything from tips on how to cope with the workload to mathematical advice of any kind. We have a very nice infrastructure, where students are always welcome, and the atmosphere created there is great, mostly thanks to our wonderful staff. It is a place where mathematical interest from the students is genuinely welcomed. The staff is always happy to stay with you, meet you outside the classroom, and generally be there for you to talk about mathematics. If you are genuinely interested in learning, I would definitely recommend applying to this programme. The quality of the teaching is excellent and the campus is beautiful. But what I think really makes mathematics at Aberdeen different from anywhere else is its staff. They will always be there for you. If you want a healthy and exciting environment where you can study mathematics, this is the place.



Professor Ran Levi

Ran Levi obtained his PhD in algebraic topology at the University of Rochester in 1993 and joined Aberdeen in 1998.

He became a professor of mathematics in 2004 and was Head of Mathematics between 2006 and 2008. His research work touches on a variety of subjects within and around algebraic topology.

In a collaborative project he established a link between algebraic topology and group representation theory, which created a new subject within algebraic topology and stimulated a flurry of activity in group theory and representation theory.

Around 2010 he started a collaboration with the Blue Brain Project in EPFL, Switzerland, and established the field of neurotopology that is currently gaining popularity among mathematicians and neuroscientists. Motivated by this collaboration Levi's work now extends further to applications of topology to science and technology. This work also inspired theoretical projects in combinatorial topology and the representation theory of posets and quivers.

Ran teaches a range of subjects from algebra and calculus for engineers to Honours year algebraic topology.

Dr Simona Paoli

My research is in pure mathematics, and spans from topology to category theory. Topology is the study of shapes and is also used in applications, for instance to data analysis. Category theory studies the way in which structures arising in different areas of mathematics can be described by a common language. This powerful approach allows the transfer of methods and results between different fields of mathematics and has inter-disciplinary applications, for instance to computer science.

I teach a range of courses across the UG curriculum, and I also supervise honours projects in my research area. The mathematics degree at Aberdeen will provide you with a solid foundation in mathematical knowledge, while developing powerful transferrable skills, such as logical problem-solving and presentation skills. This will open a range of exciting opportunities for your future, both within academia and beyond.



What you will study

Our highly regarded programme consists of two main threads which progress throughout the four years of study; analysis and algebra. In addition, in the first two years we teach several courses on foundations. In the final two years we broaden our offer to other areas of Mathematics such as Topology and Geometry.

Programme Overview

We offer a challenging syllabus that reflects our specialist expertise and emphasises reasoning, rigour and the argumentative side of mathematics as well the high levels of communication skills in demand by employers. Each semester you will take a total of 4 courses, so you can choose optional courses to fill up any spaces not occupied by compulsory courses. Students studying maths often take courses in other science subjects such as physics and computing science, but there are many other options including philosophy, economics or a foreign language.

BSc or MA?

Both the MA and BSc Mathematics (and MA and BSc Applied Mathematics) degrees consist of the same core mathematics courses. The slight difference between the MA and BSc programmes is the choice of optional courses alongside your core mathematics courses.

Programme Structure

Year 1:

- Calculus I
- Calculus II
- Algebra
- Set Theory

Year 2:

- Linear Algebra I
- Linear Algebra II
- Analysis I
- Analysis II

Year 3:

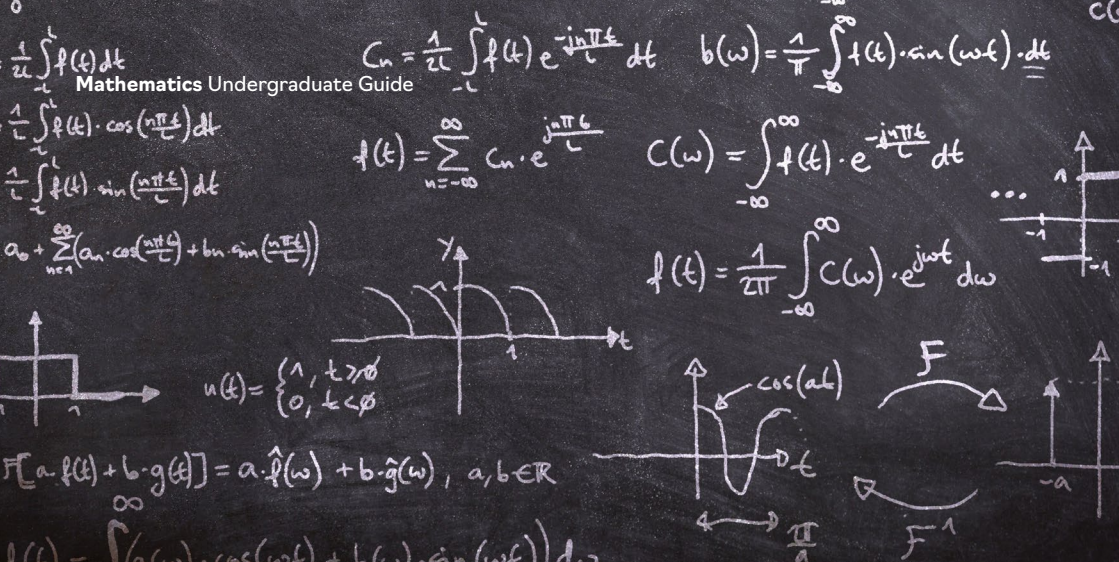
- Group Theory
- Metric & Topological Spaces
- Rings and Fields
- Analysis III
- Analysis IV
- Differential Equations

Year 4:

- Galois Theory
- Complex Analysis
- Project
- Measure Theory
- Nonlinear Dynamics & Chaos Theory I

Optional courses include:

- Financial Mathematics
- Optimisation Theory
- Number Theory
- Algebraic Topology
- Modelling Theory
- Nonlinear Dynamics & Chaos Theory II
- Knots
- Geometry



Careers and employability

A degree in Mathematics will develop your abstract reasoning and problem-solving skills and is, therefore, the gateway to a wide variety of careers in technology, business and finance, computing or data analysis sectors.

A large number of mathematics students go on to pursue careers in business and banking, as well as the science and tech sector, particularly as actuaries, data scientists, economists or market analysts.

Some of the organisations that our graduates have gone to work for in recent years include BlackRock, JPMorgan Chase, Lloyds Banking Group, HSBC, NHS Grampian, Office of National Statistics, CGG, Community Energy Scotland and Schlumberger.

Due to the ever-growing importance placed on big data by all kinds of organisations, mathematical skills are in increasing demand across all industry sectors.






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