



**QUEEN'S
UNIVERSITY
BELFAST**

MATHEMATICS

ENCOUNTER THE INFINITE

Unravel mysteries beyond the known universe.

FOLLOW YOUR PASSION

Tailor your course to suit your mathematical interests.

CAREER FOCUSED

Flexible careers, and industry placements.

**SHAPING A
BETTER WORLD**
SINCE 1845

MATHEMATICS



Why study Mathematics?

Maths has been the catalyst for advances in science and technology and it continues to transform our modern world. From the coded inner workings of tech powerhouses like Snapchat and Google to the sophisticated mathematical modelling of the Earth's atmosphere that detects climate change, those that understand maths understand how the world works.

Employers from every corner of industry need well-qualified mathematicians and statisticians, and a mathematics degree will elevate your earning potential and open up a wide choice of interesting and rewarding career paths. Surveys have shown that students with mathematics degrees earn more, on average, than those who have studied almost any other subject.

Besides offering enticing career prospects, mathematics is a fascinating and beautiful subject in itself. At Queen's, we will nurture your love for mathematics in challenging and inspiring ways.

Peer Mentoring

Our Peer Mentoring scheme allows new Mathematics students to feel connected to and supported by their new academic community. Our friendly and enthusiastic peer mentors in Mathematics are from the second and higher years and can share their experiences, and help you find your feet and settle in quickly.

As well as 'homework sessions', there is also plenty of opportunity to have fun and relax with social events such as quizzes, bowling and cinema trips organised by mentors throughout the year.

Your study options

Building on your school experience of mathematics, our degree programmes encompass pure mathematics, applied mathematics, statistics and operational research, and theoretical physics – broad subjects that are distinct, yet intertwined.

We offer you the choice and flexibility to tailor your studies with a combination of modules (or courses) to suit your individual interests and strengths. In addition, we offer joint degree programmes which allow you to combine mathematics with computer science, finance, or physics, and even to incorporate an extended period of study in Europe, if you also wish to develop your language skills.

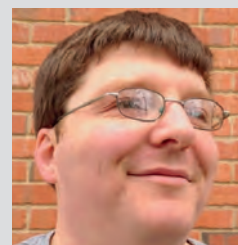
This flexibility allows you to keep your career and academic options open until you have had a chance to assess which direction suits you best. Our aim is to give you as much opportunity as possible to develop and fulfil your full potential – whatever direction it takes you.

BSc or MSci?

There are two honours degree structures available: BSc and MSci. The BSc degree is a three-year programme of study, while the four-year MSci degree programme is designed for students wishing to make significant use of mathematics in their subsequent careers. Students who reach the appropriate standard at levels 1 and 2 have the opportunity to switch from the BSc pathway to the MSci pathway.

Who will be teaching you?

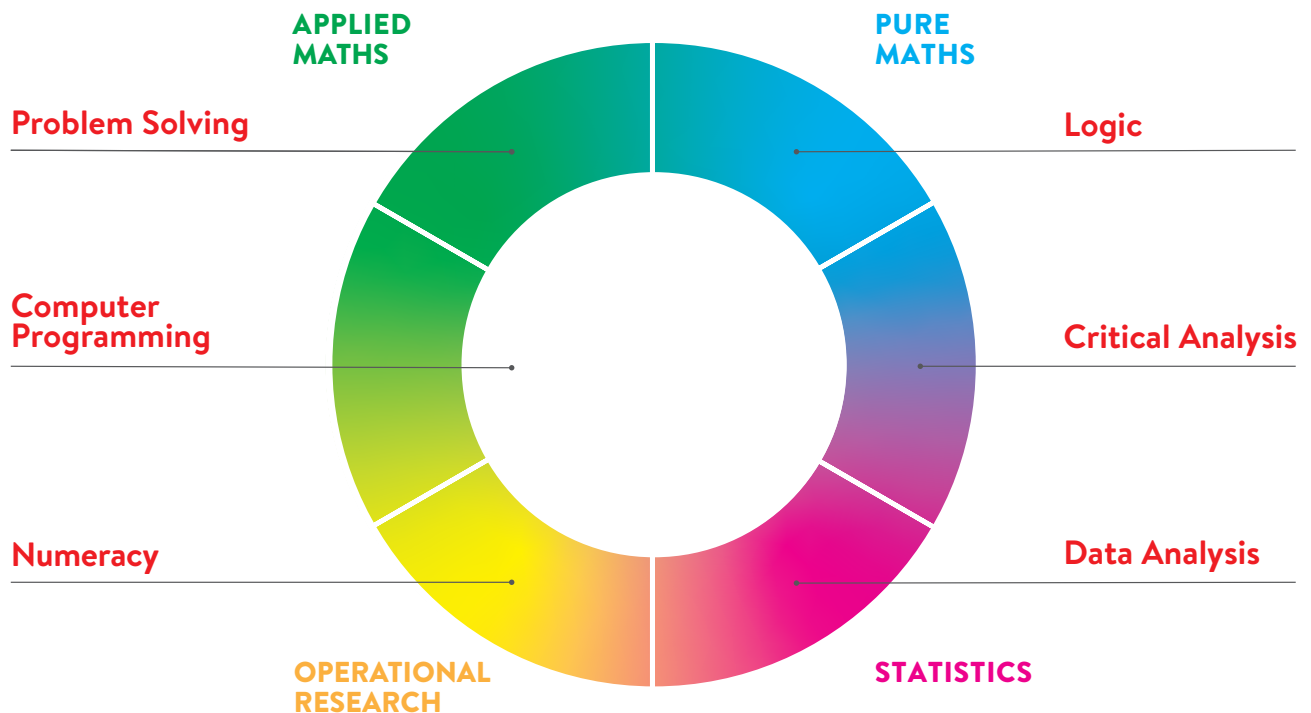
The academic staff at Queen's School of Mathematics and Physics are global experts, with 70% of the research carried out at the School deemed internationally excellent or world-leading (2014 REF). Our research into analytical methodologies, for example, is making a difference in education, road safety, finance, security, government and particularly in health. This excellence in research informs excellence in teaching, meaning that you'll benefit from up-to-the-minute, relevant lectures, taught by experts in their fields.



David Barnes
(Pure Mathematics)

My research area is algebraic topology. Topology is the study of shapes such as circles, spheres, tori (doughnuts) and more complicated objects such as the Klein bottle or infinite dimensional shapes. One of the basic questions of topology is: "which shapes can be continuously deformed into another?" For example, you can turn a square into a circle just by squashing the corners, but you can't turn a loop of rope into a knot without first breaking the loop. With algebraic topology I seek to answer these questions by attaching algebraic information-mathematical quantities such as groups or rings- to these shapes. I research how to use symmetry to simplify or improve calculations within algebraic topology.

WHAT YOU'LL LEARN



Florian Pausinger
(Applied Mathematics)

I am interested in the very basic question of how to distribute points in a uniform manner in squares, on spheres or on more complicated shapes. This apparently trivial question is actually quite complex, and very relevant for other scientific disciplines. For instance, I work with biologists studying how to get geometric information about real world objects from digital images.



Salissou Moutari
(Operational Research)

My areas of expertise include operational research, business intelligence, optimisation and machine learning. All of these techniques are concerned with the question of how to optimise complex problems, often with real-life applications in business, healthcare, transportation etc. The aim is to improve the quality, service and profitability of operations in the most efficient manner.



Catherine Ramsbottom
(Theoretical Physics)

Theoretical physics is the application of mathematical techniques to real, physical problems in the universe around us. I use high-performance computing to research the very smallest particles (atoms) in order to understand some of the largest structures (stars and galaxies) in the universe. My research also has more general applications for plasma modelling and, excitingly, sustainable, clean energy production with nuclear fusion.



Lisa McFetridge
(Statistics)

My research focuses on the exploration of complex medical data, typically uncovering the association and interactions between individuals' biomarkers, how they evolve over time and how they impact the survival of patients. I develop new statistical techniques to explore the complicated relationships that can be found within observational data with the aim of determining the key factors that influence changes over time and the impact this has on particular event(s) of interest.

AFTER GRADUATION



“My time at Queen’s was very positive – it was challenging, but it helped me to become more confident, independent and motivated. After my first year, I recognised and focussed on my love for statistics. The staff at Queen’s were so helpful in regards to careers advice. My maths degree opened up so many career opportunities; the analytical, logical and problem-solving skills developed throughout the degree were exactly what employers were looking for.

“Currently, I work as a Financial Engineer for First Derivatives - a leading provider of products and consulting services to some of the world’s largest finance, technology and energy institutions. Throughout my training, the technical and finance knowledge I obtained from my degree has proved to be invaluable.”

Roisin Mackle

Financial Engineer at First Derivatives

BSc Mathematics, Statistics and Operational Research



“I loved maths at school and was drawn to Queen’s because of the large choice of modules available; allowing you to customise your degree path to your individual subject choices. The lecturers in the department are extremely kind and helpful, and always there if you have a problem, regardless of the nature of it.

“The School now offers a peer-mentoring scheme for first years, and, as one of the first peer mentors, I can vouch for the fact that they are a funny, outgoing, helpful bunch of individuals who make first year so much easier. Not only that, they organise social events for the year, which usually involves free pizza!

“I enjoyed my time at Queen’s so much that I have now decided to study a PhD here in Pure Mathematics, which I believe will open more doors in my chosen career.”

Matthew Young

PhD student

MSci Mathematics

Year in industry

All students in the school have the option to include a year in industry as part of their studies. This is a fantastic opportunity to see mathematics at work in the real world, and to enhance your career prospects at the same time.

Your career prospects

From science and technology to modern medicine, mathematics provides the backbone to many aspects of modern society, so for graduates with skills in this area, the doors to a multitude of career options are opened. Employers love mathematics graduates for their ability to apply analytical and problem-solving skills across a wide variety of disciplines.

Whether you go on to create tech systems for multinationals or to analyse the spread of infectious diseases in the developing world, we'll equip you with the techniques and scientific language to solve problems across a range of industries and sectors.

Whatever your interest may be, maths is almost certainly involved. There are few subjects as flexible as mathematics in providing career opportunities. Here are just some examples.

Natural Sciences: For example, using mathematical modelling in oil extraction, to stop the spread of infectious disease, or to predict climate changes.

Finance and Business: Around 40–50 per cent of mathematics graduates from UK universities take up careers in business, commerce, finance and marketing in roles including financial consultants, investment analysts, chartered accountants, actuaries, business analysts, and media planners.

These industries are keen to recruit mathematicians for their logical thinking and highly developed numerical skills.

Statistics and Operational Research: Increased growth in the use of data has significantly increased the demand for statisticians. Opportunities include medical and health services statistician, pharmaceutical statistician,

biometrician, environmental statistician, market researcher, forensic statistician, government statistician, risk analyst, actuary and business analyst. Further opportunities exist in operational research through the application of mathematics to solve highly complex management problems.

Teaching: A significant percentage of our graduates pursue a teaching career after graduation. The usual route for our students who wish to become school teachers is to enrol for the Postgraduate Certificate in Education within Queen’s Graduate School of Education.

University Work and Academic Research: Lecturing and research are the two main ingredients of university work. If you love mathematics or theoretical physics for their own sake, then a university career is for you. The intellectual challenge, excitement and satisfaction of thinking through an unsolved fundamental question, and eventually arriving at an answer, is all out there for you.

The background of the entire page is a dark blue field filled with numerous out-of-focus light spots, known as bokeh. These spots vary in size and color, including shades of blue, white, yellow, orange, and a few hints of red and green. They are scattered across the frame, creating a soft, dreamy, and modern aesthetic.

“My maths degree opened up so many career opportunities; the analytical, logical and problem-solving skills developed throughout the degree were exactly what employers were looking for.”

Roisin Mackle,
Queen's Graduate
Financial Engineer at First Derivatives

**To discuss your options in more detail
or if you have any questions contact:**



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FIND OUT MORE ABOUT OUR MATHEMATICS COURSES:

<http://go.qub.ac.uk/maths>

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AND PHYSICAL
SCIENCES**