



THE UNIVERSITY
of EDINBURGH

Postgraduate Opportunities 2020

Mathematics

Influencing the world since 1583

“Edinburgh isn’t so much a city, more a way of life . . . I doubt I’ll ever tire of exploring Edinburgh, on foot or in print.”

Ian Rankin

Best-selling author and alumnus

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Influencing the world since 1583

13 Nov 2019
Postgraduate Open Day

[www.ed.ac.uk/
postgraduate open day](http://www.ed.ac.uk/postgraduate-open-day)

For more than 400 years the University of Edinburgh has been changing the world. Our staff and students have explored space, won Nobel Prizes and revolutionised surgery. They've published era defining books, run the country, made life saving breakthroughs and laid the foundations to solve the mysteries of the universe.

Our distinguished alumni include NASA astronaut Piers Sellers, former MI5 Director General Dame Stella Rimington, Olympians Sir Chris Hoy and Dame Katherine Grainger and historical greats such as philosopher David Hume, suffragist Chrystal Macmillan, who founded the Women's International League for Peace and Freedom, and physicist and mathematician James Clerk Maxwell.

International collaboration

An internationally renowned centre for academic excellence, we forge world class collaborations with partners such as the California Institute of Technology (Caltech), Stanford University, the University of Melbourne, Peking University, the University of Delhi and the University of KwaZulu Natal. As a member of the League of European Research Universities and the Coimbra Group, we link up with leading institutions across Europe.

Linking research and commerce

We were one of the first UK universities to develop commercial links with industry, government and the professions. Edinburgh Innovations promotes and commercialises our research excellence and can assist you in taking the first step to market, through collaborative research, licensing technology or consultancy.

Enhancing your career

We are committed to embedding employability in your University experience and have an impressive track record for graduate employment. From volunteering schemes to our sector leading careers service, we provide you with opportunities to develop your skills, knowledge and experience, giving you an edge in the competitive job market.

TOP 50

We're consistently ranked one of the top 50 universities in the world. We're 20th in the 2020 QS World University Rankings.

4TH

We're ranked fourth in the UK for research power, based on the 2014 Research Excellence Framework.*

83%

The majority of our research – 83 per cent – is considered world leading or internationally excellent.*

TOP 100

We are ranked in the top 10 in the UK and in the top 100 in the world for the employability of our graduates.†

£403m

In 2017/18 we won £403 million in competitive research grants.

19

There are 19 Nobel Prize winners who are alumni of the University or have been members of academic staff here.

22ND

We're ranked 22nd in the world's most international universities.‡ Since 2010, we have taught students from more than 160 countries.

 twitter.com/appliedinburgh

 facebook.com/appliedinburgh

 youtube.com/edinburghuniversity

 instagram.com/appliedinburgh

* Times Higher Education, Overall Ranking of Institutions

† Times Higher Education, Global Employability University Ranking 2018

‡ Times Higher Education: The World's Most International Universities 2019

Taught masters programmes

www.ed.ac.uk/pg/935

Computational Applied Mathematics

MSc 1 yr FT (2 yrs PT available for UK/EU students)
PgDip 9 mths FT (Exit only)

Programme description

Computational mathematics, in particular the physical applied areas and the theory and implementation of numerical methods and algorithms, has wide-ranging applications in both public and private sectors. In this era of ubiquitous, cheap computing power, there has been an explosion in the number of problems that require us to use large data sets and to understand processes by modelling them. Consequently, there is high demand for computational modellers and data scientists. This programme concentrates on the overlap and synergy between these fields.

Programme structure

You will study two semesters of taught courses followed by a dissertation. The availability of courses each year may be subject to change as the curriculum develops. Your individual dissertation will be a supervised research-style project on a topic proposed by a staff member in the applied and computational mathematics group. The project will provide practical experience and skills for tackling scientific problems requiring both computational approaches and mathematical insight. This will include identifying and applying appropriate mathematical and numerical techniques, interpreting the results, and presenting the conclusions.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Applied Dynamical Systems; Numerical Linear Algebra; Python Programming; Numerical Partial Differential Equations; Research Skills for Computational Applied Mathematics.

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Applied Stochastic Differential Equations; Bayesian Data Analysis; Bayesian Theory; Data Analytics with High Performance Computing; Data Assimilation; Fundamentals of Optimization; Large Scale Optimization for Data Science; Machine Learning in Python; Mathematics in Action A; Multi-scale Methods in Mathematical Modelling; Multivariate Data Analysis; Numerical Ordinary Differential Equations and Applications; Object-Oriented Programming with Applications; Optimization Methods in Finance; Statistical Programming; Stochastic Modelling; Time Series.

Career opportunities

This programme will provide training in the tools and techniques of mathematical modelling and scientific computing, and provides you with skills for problem solving using modern applied mathematics techniques.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in a numerate discipline such as mathematics, engineering, computer or physical sciences. Previous study of applied mathematics, probability and differential equations at university level will be required. Applicants should have studied a university-level course with a substantial programming element, or have an equivalent level of programming experience.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

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www.ed.ac.uk/pg/894

Computational Mathematical Finance

MSc 1 yr FT (2 yrs PT available for UK/EU students)
PgDip 9 mths FT

Programme description

This dynamic programme delivers high-quality training in the theory of mathematical finance and emphasises computational methods. Graduates are expected to have a working knowledge of advanced computational finance (including construction of algorithms and programming skills) and a sound knowledge of the theory of probability and stochastic analysis. These are the core theories needed in the modern valuation of complex financial instruments. The programme delivers:

- a flexible programme of study relevant to the needs of employers such as top investment banks, hedge funds and asset management firms;
- a solid knowledge in financial derivative pricing, risk management and portfolio management; and
- the transferable computational skills required by the modern quantitative finance world.

Placements

Adding depth to your learning, a work placement puts you at the heart of financial organisations such as Aberdeen Standard Investments, Lloyds Banking Group, Moody's Analytics and Royal Bank of Scotland.

Programme structure

There are two streams, each of two taught semesters and a dissertation.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Discrete-Time Finance; Numerical Probability & Monte Carlo; Object-Oriented Programming with Applications; Research-Linked Topics; Risk-Neutral Asset Pricing; Stochastic Analysis in Finance; Stochastic Control and Dynamic Asset Allocation. Computational stream: Numerical Partial Differential Equations; Time Series. Financial stream: Financial Risk Theory; Optimization Methods in Finance.

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Applied Databases; Bayesian Theory; Credit Scoring; Finance, Risk and Uncertainty; Financial Risk Theory; Integer and Combinatorial Optimization; Machine Learning in Python; Numerical Partial Differential Equations; Optimization Methods in Finance; Parallel Numerical Algorithms; Programming Skills; Python Programming; Scientific Computing; Time Series.

Career opportunities

You can expect to go on to work in major financial institutions or to continue your studies by joining a PhD programme.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in mathematics or a mathematical subject such as statistics, physics or engineering. You must also have relevant programming experience (at least one semester undergraduate programming course, in any language such as C, C++, Java, or Python, passed at 2:1 level).

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Programme Director Dr David Siska
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www.ed.ac.uk/pg/118

Financial Mathematics

MSc 1 yr FT

Programme description

This masters is run jointly with Heriot-Watt University. It provides you with expertise in financial mathematics, including stochastic calculus, and a range of practical techniques for analysing financial markets. You will also learn quantitative skills for developing and managing risk that are in high demand since the recent financial crisis.

Placements

Adding depth to your learning, a work placement puts you at the heart of financial organisations such as Aberdeen Standard Investments, Lloyds Banking Group, Moody's Analytics and Royal Bank of Scotland.

Programme structure

This programme involves two taught semesters of compulsory and option courses, followed by a dissertation project. Taught elements of the programme will be delivered by both Heriot-Watt University and the University of Edinburgh and you will attend each institution as appropriate. Your dissertation will be supervised by staff from Heriot-Watt University.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Discrete-Time Finance; Stochastic Analysis in Finance (delivered by the University of Edinburgh).

Credit Risk Modelling; Derivatives Markets; Derivative Pricing and Financial Modelling; Financial Markets; Special Topics (delivered by Heriot-Watt University).

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Optimization Methods in Finance; Simulation; Stochastic Control and Dynamic Asset Allocation (delivered by the University of Edinburgh).

Financial Econometrics; Numerical Methods of Partial Differential Equations; Portfolio Theory; Statistical Inference; Statistical Methods; Time Series Analysis (delivered by Heriot-Watt University).

Career opportunities

Graduates typically work in major financial institutions or continue their studies by joining PhD programmes. Recent graduates are now working as bankers, financial consultants, tax administrators, and risk, portfolio, quantitative and credit analysts, for employers such as EY, Barclays Bank, Scottish Widows, Standard Life Aberdeen, Moody's Analytics and the People's Bank of China.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in mathematics or a mathematical subject such as statistics, physics or engineering.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Programme Contact MACS PG Enquiries
Tel +44 (0)131 451 4152
Email macspgenquiries@hw.ac.uk



www.ed.ac.uk/pg/640

Financial Modelling & Optimization

MSc 1 yr FT (2 yrs PT available for UK/EU students)
PgDip 9 mths FT

Programme description

This programme gives you a flexible syllabus to suit the demands of employers that use modern financial tools and optimization techniques in areas such as the financial sector and energy markets. We will give you sound knowledge in financial derivative pricing, portfolio optimization and financial risk management. We will also provide you with the skills to solve some of today's financial problems, which have themselves been caused by modern financial instruments. This expertise includes modern probability theory, applied statistics, stochastic analysis and optimization.

Placements

Adding depth to your learning, a work placement puts you at the heart of financial organisations such as Aberdeen Standard Investments, Lloyds Banking Group, Moody's Analytics and Royal Bank of Scotland.

Programme structure

This programme involves two taught semesters followed by a dissertation.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Discrete-Time Finance; Fundamentals of Optimization; Numerical Probability & Monte Carlo; Optimization Methods in Finance; Research-Linked Topics; Risk-Neutral Asset Pricing; Stochastic Analysis in Finance.

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Advanced Time Series Econometrics; Combinatorial Optimization; Computing for Operational Research & Finance; Credit Scoring; Finance, Risk and Uncertainty; Financial Risk Management; Financial Risk Theory; Fundamentals of Operational Research; Large Scale Optimization for Data Science; Modern Optimization Methods for Big Data Problems; Multivariate Data Analysis; Nonlinear Optimization; Numerical Partial Differential Equations; Object-Oriented Programming with Applications; Parallel Numerical Algorithms; Programming Skills; Risk Analysis; Stochastic Control and Dynamic Asset Allocation; Stochastic Modelling; Stochastic Optimization.

Career opportunities

Graduates have gone on to work in major financial institutions or to continue their studies by joining PhD programmes. Recent graduates are now working as financial consultants, tax administrators, and risk, quantitative and credit analysts, for employers such as EY, Barclays Bank, Santander, Scottish Widows, Moody's Analytics and the People's Bank of China.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in mathematics or a mathematical subject such as statistics, physics or engineering.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Programme Director Dr David Siska

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See also...

Taught masters programmes in related fields are also offered by the University of Edinburgh Business School, the School of Economics, School of Informatics and the School of Physics & Astronomy.

www.ed.ac.uk/studying/prospectus-request

www.ed.ac.uk/pg/116 (Operational Research)
www.ed.ac.uk/pg/499 (OR with Computational Optimization)
www.ed.ac.uk/pg/498 (OR with Risk)

Operational Research/ OR with Computational Optimization/OR with Risk

MSc 1 yr FT (2 yrs PT available for UK/EU students)
PgDip 9 mths FT

Programme description

This programme will show you how to use mathematical techniques to tackle real-life problems ranging from scheduling flights and routing mobile phone calls to managing investments and minimising risks. Operational Research (OR) is an important skill that is in high demand. Our intensive programme allows you to specialise in an area that best suits your career goals. In addition to the general MSc in Operational Research, we offer the programmes Operational Research with Risk and Operational Research with Computational Optimization.

Programme structure

These programmes involve two taught semesters of compulsory and option courses followed by your dissertation project. Many dissertation projects are carried out as part of an external placement in industry.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Fundamentals of Operational Research; Fundamentals of Optimization; Methodology, Modelling and Consulting Skills; Simulation; Stochastic Modelling.

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Option courses are generally grouped into the following areas: finance, industry, optimization and statistics.

As part of your option course choices, **Operational Research with Computational Optimization** requires you to study a combination from *Integer and Combinatorial Optimization; Large Scale Optimization for Data Science; Machine Learning in Python; Object-Oriented Programming with Applications; Introductory Probability and Statistics; Python Programming; Statistical Methodology; Statistical Programming; Topics in Applied Optimization*. **Operational Research with Risk** requires you to study a combination from *Credit Scoring; Machine Learning in Python; Object-Oriented Programming with Applications; Introductory Probability and Statistics; Python Programming; Risk and Logistics; Statistical Methodology; Statistical Programming; Topics in Applied Operational Research; Topics in Applied Optimization*.

Career opportunities

The skills you will learn are in demand by a vast range of high-profile organisations including consultancy firms, companies with operational research departments such as airlines or telecommunications providers, financial firms and the public sector. Recent graduates have joined Deloitte, CapGemini, PricewaterhouseCoopers, British Airways, Proctor & Gamble, Lloyds and Royal Bank of Scotland.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in a numerate discipline such as mathematics, engineering, computer science, physical or biological sciences, economics or business. You can increase your chances of a successful application by exceeding the minimum requirements.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Programme Director Dr Joerg Kalcsics

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www.ed.ac.uk/pg/915

Operational Research with Data Science

MSc 1 yr FT (2-3 yrs PT available for UK/EU students)

Programme description

This programme will show you how to use mathematical techniques to tackle real-life problems ranging from scheduling flights and handling large data sets to managing investments and minimising risks. The skills of operational research and data science are in high demand. This is a new, forward-looking programme that delivers high-quality training. You will develop strong technical skills in operational research, optimization and statistics, practical skills in programming and modelling for a wide range of applications and communications skills in writing and audio-visual presentation. This programme is accredited by the Royal Statistical Society.

Programme structure

This MSc consists of two semesters of taught courses, assessed by coursework and examinations. You will undertake four compulsory courses in semester one and 60 credits of option courses in semester two, before starting work on a three-month dissertation project.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Fundamentals of Operational Research; Fundamentals of Optimization; Methodology, Modelling and Consulting Skills.

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Algorithmic Game Theory and its Applications; Bioinformatics; Biomedical Data Science; Computational Cognitive Neuroscience; Credit Scoring; Data Mining and Exploration; Generalised Regression Models; Incomplete Data Analysis; Integer and Combinatorial Optimization; Introductory Applied Machine Learning; Large Scale Optimization for Data Science; Machine Learning and Pattern Recognition; Machine Learning in Python; Object-Oriented Programming with Applications; Operational Research in the Energy Industry; Optimization Methods in Finance; Probabilistic Modelling and Reasoning; Python Programming; Reinforcement Learning; Risk and Logistics; Statistical Methodology; Statistical Programming; Stochastic Modelling; The Analysis of Survival Data; Time Series; Topics in Applied Operational Research; Topics in Applied Optimization. You may also select options in the areas of finance, industry, optimization, statistics and data science.

Career opportunities

Graduates will gain the transferable skills required to pursue careers in a data-rich operational research environment, and will be in an ideal position to apply for work in a wide range of institutions in the public and private sector. Recent graduates have joined Barclays, CapGemini, EY, Mckle|Aquila, British Airways and Royal Bank of Scotland. The programme is also excellent preparation for further study in operational research, optimization or data science.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in a numerate discipline such as mathematics, engineering, computer science, physical or biological sciences, economics or business. You must also have studied probability and statistical theory at university level. You can increase your chances of a successful application by exceeding the minimum programme requirements.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Programme contact Dr Joerg Kalcsics

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www.ed.ac.uk/pg/660

Statistics & Operational Research

MSc 1 yr FT (2 yrs PT available for UK/EU students)

Programme description

This programme will help you develop professionally in the theory and practice of statistics and operational research (OR), providing the foundations for a successful career.

It will prepare you for work in areas such as the medical and health industry, government, the financial sector and any other area where modern statistical tools and OR techniques are used. You will also develop the wider skills required for solving problems, working in teams and time management.

You will be able to identify and apply appropriate statistical or operational techniques to practical problems. This will include specifying appropriate models and fitting these models using appropriate computer packages.

Programme structure

This MSc consists of two semesters of lecture-based courses and practical, lab-based courses assessed by a combination of exams, written reports and programming assignments. Following successful completion of the courses, you will undertake a dissertation, which may take the form of an industrial project.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Bayesian Theory; Fundamentals of Operational Research; Fundamentals of Optimization; Generalised Regression Models; Methodology, Modelling and Consulting Skills; Simulation; Statistical Programming; Statistical Research Skills.

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Bayesian Data Analysis; Biomedical Data Science; Credit Scoring; Genetic Epidemiology; Incomplete Data Analysis; Integer and Combinatorial Optimization; Large Scale Optimization for Data Science; Machine Learning in Python; Nonparametric Regression Models; Operational Research in the Energy Industry; Python Programming; Risk and Logistics; ; Statistical Consultancy; Statistical Methodology; Stochastic Modelling; The Analysis of Survival Data; Time Series; Topics in Applied Operational Research; Topics in Applied Optimization.

Career opportunities

This programme is ideal for students who wish to apply their statistics and operational research knowledge within a wide range of sectors, including the medical/health sector, government, transport/airlines and finance. The advanced problem-solving skills you will develop will be highly prized by many employers.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in a numerate discipline such as mathematics, engineering, computer science, physical or biological sciences, economics or business. You can increase your chances of a successful application by exceeding the minimum programme requirements. You must also have studied probability and statistical theory at university level.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Programme Director Dr Bruce Worton

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www.ed.ac.uk/pg/916

Statistics with Data Science

MSc 1 yr FT (2-3 yrs PT available for UK/EU students)

Programme description

In this digital, data-rich era, the demand for statistics graduates from industry, the public sector and academia is high, yet the pool of such graduates is small. The recent growth of data science has increased the awareness of the importance of statistics, with the analysis of data and interpretation of the results firmly embedded within this newly recognised field. This MSc is designed to train the next generation of statisticians with a focus on the newly recognised field of data science. It combines rigorous statistical theory with wider hands-on practical experience of applying statistical techniques to data and correctly interpreting the associated results. You will be trained in both classical and Bayesian ideologies and associated computational software, including R, for fitting a range of different models to data. There will be significant practical experience applying different statistical techniques. This programme is accredited by the Royal Statistical Society.

Programme structure

You will study lecture-based and practical, lab-based courses, assessed by exams, written reports and programming assignments, followed by a dissertation, usually in the form of a consultancy-style research project.

COMPULSORY COURSES PREVIOUSLY OFFERED INCLUDE:

Bayesian Data Analysis; Bayesian Theory; Generalised Regression Models; Incomplete Data Analysis; Statistical Programming; Statistical Research Skills.

OPTION COURSES PREVIOUSLY OFFERED INCLUDE:

Biomedical Data Science; Credit Scoring; Data Mining and Exploration; Extreme Computing; Fundamentals of Operational Research; Fundamentals of Optimization; Genetic Epidemiology; Large Scale Optimization for Data Science; Machine Learning and Pattern Recognition; Machine Learning in Python; Nonparametric Regression Models; Object-Oriented Programming with Applications; Probabilistic Modelling and Reasoning; Python Programming; Simulation; Statistical Consultancy; Statistical Methodology; Stochastic Modelling; Text Technologies for Data Science; The Analysis of Survival Data; Time Series.

Career opportunities

Trained statisticians are in high demand due to an increasingly data-aware society. We anticipate that the majority of graduates will be employed as statisticians within private and public institutions providing statistical advice/consultancy. The statistical, analysis/interpretation and communication skills you will develop and your knowledge of the underlying statistical principles, coupled with practical experience of implementing statistical techniques using standard software across a range of applications, will ensure you are ideally placed for a range of job opportunities or for further study.

Entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in a numerate discipline such as mathematics, engineering, computer science, physical or biological sciences, economics or business. You can increase your chances of a successful application by exceeding the minimum programme requirements. You must also have studied probability and statistical theory at university level.

English language requirements

See page 20.

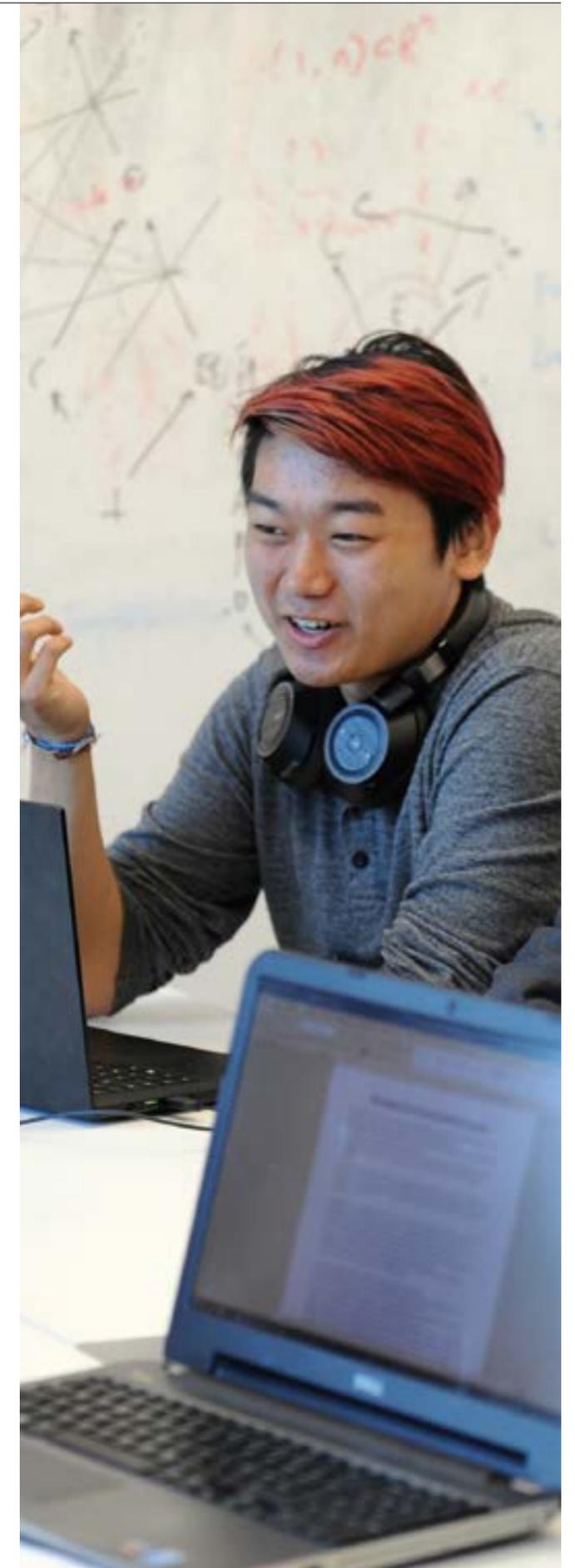
Fees and funding

For fees see page 20 and for funding information see page 22.

Programme Director Dr Bruce Worton

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Research at the School of Mathematics

We undertake research in areas of the mathematical sciences, including pure, applied, statistics, operational research and mathematical physics, and provide a stimulating and inspiring environment in which to develop your research career.

The Maxwell Institute for Mathematical Sciences (established in collaboration with Heriot-Watt University in 2005) represents a partnership of more than 70 staff members at both institutions. The Institute pools research from both universities to offer a research and postgraduate training environment that can attract the best mathematics talent from around the world. As a new PhD student, you will be part of the Maxwell Institute Graduate School (MIGS). In Year 1, you will share a common space with PhD students from Heriot-Watt and our joint MAC-MIGS CDT within the new Bayes Centre in the Central Area. The Bayes Centre provides an exciting interdisciplinary environment and hosts the International Centre for Mathematical Sciences (ICMS). This rich environment includes a lively seminar programme, encompassing all areas of mathematics, operational research and statistics: www.maxwell.ac.uk

Since 2018 we have offered a unique PhD experience under the umbrella of the Maxwell Graduate School. High quality academic training, in the form of courses and seminar series, is offered jointly. All our PhD students receive training in transferable skills in one of three streams, based on your preference – teaching, outreach, or industry. There is a separate application process for each institution and you will be awarded your degree from the institution where you have applied. If you are interested in any of the University of Edinburgh's research areas listed here, please apply online through our Degree Finder:

- algebra;
- computational mathematics;
- geometry and topology;
- mathematical analysis;
- mathematics education;
- mathematical physics;
- operational research and optimization;
- partial differential equations (PDEs);
- probability and stochastic analysis; and
- statistics.

MAC-MIGS

MIGS runs the Centre for Doctoral Training in Mathematical Modelling, Analysis & Computation (MAC-MIGS), a prestigious Engineering and Physical Sciences Research Council (EPSRC) funded PhD programme which offers outstanding prospects if you are interested in the formulation, analysis and implementation of state-of-the-art mathematical and computational models. This fully-funded four-year training and research programme will equip you with the skills needed to tackle the challenges of data-intensive modelling and take up leadership roles in industry, academia and government. You will have opportunities for multidisciplinary collaboration with chemists, physicists, biologists, engineers and computer scientists, interaction with more than 30 industrial and governmental partners, and visits to and from international collaborators around the world. MAC-MIGS offers up to 15 fully-funded places each year. A number of additional industry-driven PhD projects will also be available, which you will be able to select when applying. For the MAC-MIGS integrated programme in Mathematical Modelling, Analysis & Computation, see page 13. For further information see: www.mac-migs.ac.uk

ICMS

This research institute works to develop mathematical sciences in new directions, supports and develops mathematics that is relevant and in demand from other sciences, industry and commerce, and fosters collaboration between mathematics departments across Scotland.

Postgraduate research programmes Entry requirements

A UK first class honours degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in an appropriate subject; or a UK 2:1 honours degree plus a UK masters degree, or their international equivalents; or relevant qualifications and experience. Please check the specific entry requirements for your programme online before applying.

For further information about applying: edin.ac/maths-phd-application



Research opportunities

www.ed.ac.uk/pg/509

Algebra

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Our algebra research group is made up of international leaders in the field who have won between them the European Mathematical Society Prize, the Whitehead Prize of the London Mathematical Society, the Waclaw Sierpinski Prize of the Polish Academy of Sciences and the Berwick Prize of the London Mathematical Society.

Our members have given invited lectures at both the International Congress of Mathematicians and the European Congress of Mathematicians.

Our research focuses on several areas: non-commutative ring theory; non-commutative algebraic geometry; Lie-theoretic representation theory; geometric representation theory; quantum algebra; commutative algebra; and category theory.

Much of our research is related to the areas of geometry and topology, and mathematical physics, which has led to the formation of the Hodge Institute: hodge.maths.ed.ac.uk

Through the School's membership of the Maxwell Institute, we present regular seminars, and run our own informal seminars and colloquia. We also serve on editorial boards of various international journals. All of our PhD students take part in international conferences and symposia and, in part thanks to this global exposure, many have gone on to postdoctoral positions throughout the world.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

www.ed.ac.uk/pg/510

Analysis

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Our analysis research group is one of the UK's top centres for research in the field, especially in linear and nonlinear partial differential equations (PDEs) and harmonic analysis. Your passion for mathematical analysis will be rewarded by contact with, and supervision by, world-leading academic staff, a rich seminar and working group programme and ultimately a qualification that boasts an internationally-respected pedigree.

Research

We have a unique focus on the interplay of classical Euclidean harmonic analysis with the modern theory of PDEs. We study harmonic analytic ideas in number theory, geometric measure theory, combinatorics, and discrete geometry and geometrically invariant inequalities; and we investigate applications of harmonic analysis to elliptic and parabolic PDEs with rough coefficients and/or on rough domains. We also study: nonlinear hyperbolic, dispersive and kinetic equations and systems arising in the classical field theories of mathematical physics, mathematical biology and, in connection with black holes, mathematical general relativity; free-boundary problems, optimal mass transportation and Monge-Ampère equations in nonlinear elasticity and other continuum theories; and well-posedness for supercritical initial value problems with noisy initial data.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

See also...

You may find your preferred research area in the prospectus of another School within the University, in particular the University of Edinburgh Business School or the Schools of GeoSciences, Informatics or Physics & Astronomy.

www.ed.ac.uk/studying/prospectus-request

www.ed.ac.uk/pg/511

Applied & Computational Mathematics

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

The Applied & Computational Mathematics research group combines expertise in dynamics, continuum and statistical mechanics, stochastic methods and advanced scientific computing to develop new techniques for applications such as data analytics, molecular dynamics, geophysical and astrophysical fluids, and material sciences.

If you have a passion for applied mathematics, our facilities, people and environment will enable you develop your research ideas to their full potential.

Research environment

Our research themes are varied and multidisciplinary. They include numerical methods for ordinary, partial and stochastic differential equations, data science, fluid dynamics, multiscale modelling, molecular and Hamiltonian dynamics, nonlinear waves, biology, and asymptotics.

Our work is supported by first-rate high-performance computing facilities including the Archer supercomputer, the UK's preeminent academic computing system. The group is strengthened by its involvement in interdisciplinary initiatives and centres including the Alan Turing Institute – the UK's national data-science hub – the Edinburgh Fluid Dynamics Group, and SynthSys (Synthetic and Systems Biology) which fosters interactions with biologists.

Through the Maxwell Institute we have many collaborations and shared activities with Heriot-Watt University, for example the Edinburgh chapter of the Society for Industrial and Applied Mathematics (SIAM). A rich seminar and workshop programme brings many international research leaders to Edinburgh each year, strengthening our staff and students' links with the broader community.

Additional resources

Most research projects in Applied & Computational Mathematics can be carried out as part of the MAC-MIGS integrated programme in Mathematical Modelling, Analysis & Computation (see page 13). We encourage all students interested in an Applied & Computational Mathematics PhD to consider applying for MAC-MIGS to take advantage of its fully-funded enhanced research and training programme.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

www.ed.ac.uk/pg/512

Geometry & Topology

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Our Geometry and Topology research group has strong links with both the Algebra and the Mathematical Physics research groups, as you can find at our common home in the Hodge Institute:

hodge.maths.ed.ac.uk

You'll find this invaluable, as opportunities to discuss your work and expand your thinking abound. Working within one of the largest mathematics groups in the UK, you'll be completing your programme in an environment that hums with a busy graduate school life, and you'll have the chance to make your mark in seminars, workshops, clubs and outings.

Our interests include algebraic geometry, derived categories, symplectic geometry, algebraic and geometric topology, twistor theory, category theory and integrable systems.

While we can offer a large community of researchers under one roof, we believe in encouraging you to gain as broad a perspective as possible. The best way to do this is to involve yourself in the international dialogue on your research area, through attending conferences and symposia, and visiting your peers in centres of research worldwide. Throughout your studies, you'll be given opportunities to travel to events and institutions that will allow you to gain this perspective, and open up new areas of investigation.

English language requirements

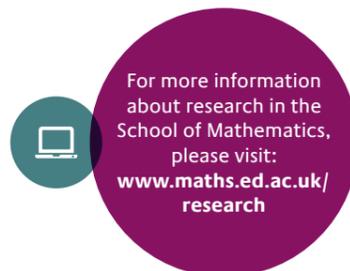
See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

www.ed.ac.uk/pg/980

Mathematical Modelling, Analysis and Computation

PhD 4 yrs FT

Research profile

You will join the Maxwell Institute Graduate School in its home at the Bayes Centre in the Central Area. You will benefit from:

- dedicated academic training in subjects that include mathematical analysis, computational mathematics, multi-scale modelling, model reduction, Bayesian inference, uncertainty quantification, inverse problems and data assimilation, and machine learning;
- extensive experience of collaborative and interdisciplinary work through projects, modelling camps, industrial sandpits and internships;
- outstanding early-career training, with a strong focus on entrepreneurship; and
- a dynamic and forward-looking community of mathematicians and scientists, sharing strong values of collaboration, respect, and social and scientific responsibility.

You will be integrated into a vibrant research environment, closely interacting with academics, including mathematicians from the University of Edinburgh and Heriot-Watt University, computer scientists, biologists, engineers, physicists and chemists, as well as many industrial and government partners.

For further information see: www.mac-migs.ac.uk

Programme structure

In Year 1, you will take compulsory courses and group project modules as well as receiving instruction from either the Scottish Mathematical Sciences Training Centre, or from the University of Edinburgh or Heriot-Watt University. You will also commence supervised research work which will continue in subsequent years alongside additional coursework and training. In each year, you will take part in a week-long industrial sandpit, in conjunction with industrial partners, to gain insights into how mathematics is used. Work placements are negotiable and encouraged. Visits and internships are possible with a range of 30 companies and government agencies, interdisciplinary partners across the sciences and engineering, or with our network of a dozen international academic partners in the US and Europe.

The programme leads to a PhD awarded jointly by the University of Edinburgh and Heriot-Watt University.

The Bayes Centre

The Bayes Centre is at the heart of data-driven scientific and mathematical activity in Edinburgh. It provides a dynamic interdisciplinary research environment that will provide a tremendous variety of opportunities for PhD students to interact with world-leading researchers, visitors and workshops at ICMS, with start-up companies, with data scientists and with high performance computing specialists at the Edinburgh Parallel Computing Centre.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact MAC-MIGS Administrator

Email info@mac-migs.org.uk

www.ed.ac.uk/pg/513

Mathematical Physics

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Mathematical Physics is a multidisciplinary research group with close connections with the Hodge Institute. You'll benefit from being not only in one of the largest mathematics research groups in the UK but also part of the Edinburgh Mathematical Physics Group – a joint research collective formed in 1999 with Heriot-Watt University and now part of the Maxwell Institute.

Research environment

Our research interests span a wide range of subjects within contemporary mathematical physics.

Our central goal is to understand the principles allowing a unification of general relativity and quantum mechanics, mainly within the gauge/gravity correspondence. From the gravitational side, we are interested in the geometry and classification of higher dimensional black holes and of supersymmetric supergravity backgrounds, the construction of traversable wormholes and what the asymptotic symmetries of near horizons can teach us about the quantum theory. From the quantum side, we are interested in the connections between quantum information, strongly correlated condensed matter systems and geometry, mainly through entanglement, complexity, tensor networks and disordered systems.

We are fascinated by the extension of the AdS/CFT correspondence to other geometries. One fruitful direction we are exploring is to consider different limits such as flat and non-relativistic limits, from the algebraic, field theory and geometric perspectives. Hence we are interested in the study of the BMS group, the formulation of field theories and gravity using Newton-Cartan and Carrollian structures.

Exact solutions (be they of supersymmetric gauge theories, gravity, classical mechanics or geometric problems such as constructing minimal surfaces and harmonic maps) are often good testing grounds: integrability here is a recurring theme and tool in their construction. We are interested in integrable systems both abstractly and in the concrete settings just noted. We study gauge theoretic moduli spaces via integrable systems techniques, displaying an interplay between the algebraic geometry of curves and their associated function theory. This research has led to computer implementations of various algebro-geometric constructions.

Valuable connections

As well as experiencing a vibrant research environment that brings you into contact with a broad group of your peers, your membership of the Edinburgh Mathematical Physics Group will give you access to a dynamic programme of seminars, lecture courses and conferences. There is a dedicated website and a comprehensive range of graduate activities. More information: empg.maths.ed.ac.uk/

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

www.ed.ac.uk/pg/953

Mathematics Education

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Our Mathematics Education research group undertakes evidence-based study into a wide range of aspects of university level learning of mathematics, statistics and operational research. Our aim is to develop and evaluate research-based instructional strategies, by gathering and analysing both quantitative and qualitative data, with a view to being able to improve student learning in the subject and related cognate areas.

Research environment

We are interested in undertaking research to develop an evidence-based expansion of the effective use of technology in teaching and learning mathematics, statistics and operational research at the university level. For example, we are a world-leading centre for automatic online assessment of mathematics. We also have broader interests in assessment, including flipped-classroom and peer instruction. Current interests within the group related to education and educational technology include:

- automatic online assessment of mathematics;
- effective use of technology in teaching and learning mathematics more generally, including programming and online teaching;
- design of assessments for learning, including evaluation of curricula sequences; and
- evaluation of teaching interventions such as flipped classroom.

Valuable connections

The University of Edinburgh is a world-leader in digital education, spanning the full range of activities including Massive Open Online Courses (MOOCs) and online learning of postgraduate programmes. By joining the School of Mathematics you will have opportunities to interact with educational research groups in cognate disciplines such as the Edinburgh Physics Education Group, and the interdisciplinary Centre for Research in Digital Education. As a research student you will be part of a vibrant and dynamic community of educators, with expertise in educational research and opportunities to develop and pursue your research goals. You can be certain of a rich academic setting with opportunities available for students to gain a breadth of knowledge from leading experts.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

www.ed.ac.uk/pg/514

Optimization & Operational Research

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Research environment

The work in the Operational Research and Optimization research group is divided into three main areas: the mathematical and computing aspects of optimization, combinatorial optimization, and energy systems. The core technology in optimization is the solution of large sparse linear and quadratic problems. We provide world-class expertise in the two main solution methods for these: the simplex method and the interior point method. In combinatorial optimization, we provide expertise for modelling real-world problems using integer linear programming formulations and for deriving efficient exact and heuristic algorithms to solve them. Specialist expertise in energy includes optimization of system planning and optimization, security of supply risk analysis, and decision support for public policy.

We also have interests in PDE-constrained optimization, global optimization, decomposition methods, parallel computing, industrial applications of optimization and stochastic optimization.

Specific topics which could yield PhD projects include:

- algorithms for linear and nonlinear nonconvex smooth optimization problems;
- optimization methods for linear, integer linear, quadratic and nonlinear programming;
- decomposition methods for large-scale nonlinear nonconvex constrained optimization;
- bundle methods;
- warm starts for interior point methods;
- pooling problems;
- applications of optimization in logistics;
- parameter uncertainty in queueing theory and revenue management; and
- facility location and vehicle routing.

Valuable connections

Being part of the Operational Research and Optimization group will give you the opportunity to meet and confer with academics worldwide. You will be a member of the Edinburgh Research Group in Optimization (ERGO) which, through its regular seminar series, attracts local and international researchers interested in the development of operational research and optimization. As a group, we are currently collaborating with researchers in Denmark, the Netherlands, Canada, USA, Italy, Norway, China, France, Spain, Germany and Turkey, and are invited to give addresses and organise workshops at major optimization, OR and energy conferences.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

www.ed.ac.uk/pg/515

Probability & Stochastic Analysis

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Our Probability and Stochastic Analysis research group operates in what is perhaps the most widely applied area of mathematics. The financial sector, in particular, is a major focus of our research, and graduates with the right research experience can make their way into highly rewarding roles in industry. As part of our small, specialised group, you'll enjoy a research environment that features a balance between theory and practice, access to one of the most powerful computing facilities in the UK and strong links with relevant industries.

Research

Our research focuses on the following themes: stochastic differential equations and stochastic partial differential equations (PDEs) and their applications in nonlinear filtering and stochastic control; applications of stochastic analysis of PDEs, stochastic PDEs and stochastic differential equations (accelerated numerical methods in particular).

We're also involved in the applications of probability theory, mainly to mathematical finance, particularly stochastic volatility models, equivalent martingale measures and incomplete markets. Other applications include engineering, signal processing and biological sciences.

Valuable connections

With the financial sector being the major commercial employer of our graduates, our involvement with the Scottish Financial Risk Academy, established in conjunction with Heriot-Watt University, offers valuable industry links and training. You can benefit from short project internships with leading financial institutions, visits from leading risk scholars, and a series of knowledge exchange courses and events.

Unparalleled computing

The Probability & Stochastic Analysis group also gives you access to the Edinburgh Parallel Computing Centre (EPCC), one of Europe's leading supercomputing facilities. EPCC enables high-level grid computing, data integration, and computer simulation and process optimization. We offer training in all the relevant programs required to achieve your research aims.

Rewarding career options

Many of our graduates take up lucrative positions with high-profile financial companies. A large number also pursue careers in academia, while others apply their skills in engineering or biological sciences.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

www.ed.ac.uk/pg/516

Statistics

PhD 3 yrs FT (6 yrs PT available for UK/EU students)

Statistics is the branch of mathematics that deals with uncertainty and the particular application of 'making sense of data'. It is a core element of the newly recognised area of data science, involving the development of new techniques for analysing data within a rigorous framework. The Statistics research group explores a wide range of statistical theory and practice, applying newly developed theories/techniques in collaboration with researchers in related fields, such as informatics, biostatistics, health, ecology, and geosciences.

Research

Statistical research spans both the classical and Bayesian paradigms with a strong data science component. Particular areas of interest include efficient computationally intensive techniques, hidden (semi-)Markov models, hierarchical models, multivariate models, time-series models, spatio-temporal models, wavelets, non-parametric regression, machine learning extreme value theory, point processes and nonparametric Bayes. The group builds on a strong theoretical base, developing new statistical methodology applied to a wide range of different application areas including biostatistics, ecology, econometrics, epidemiology, health, law, environment, geosciences, medicine, and functional genomics data, such as gene expression microarrays.

Valuable connections

As a research student, you will find a wealth of expertise available via our links with theorists and practitioners in related fields. For example, the Centre for Statistics, launched in 2017, unites data-driven researchers from across the University of Edinburgh and associated institutions. Several members of the Statistics group are also Faculty Fellows of the Alan Turing Institute, the national institute for data science and artificial intelligence, of which the University of Edinburgh is a founding member. The Statistics group also has close links with other Schools across the University, including Informatics, Geosciences and Business. In addition, the Statistical Consultancy Unit within the University and the Scottish Government-backed associated research institute Biomathematics and Statistics Scotland (BioSS) both have bases in the same building as the School of Mathematics, providing a strong close network to other researchers with an interest in statistical methodology, bioinformatics, and process and systems modelling. The University of Edinburgh is also a member institute of the Academy of PhD Training in Statistics (APTS), providing additional residential training in advanced statistical techniques.

Rewarding career options

You will gain a qualification that is highly regarded and in high demand. This will lead to excellent career prospects in academia, industry and with government bodies.

English language requirements

See page 20.

Fees and funding

For fees see page 20 and for funding information see page 22.

Contact Graduate School Administrator

Email pgresearch@maths.ed.ac.uk

Our involvement with the Scottish Financial Risk Academy offers valuable links and training.

About the School of Mathematics

By joining the University of Edinburgh's School of Mathematics, you'll follow in the footsteps of mathematical pioneers and study alongside some of the most exciting minds working in the field today.

Whether you wish to follow a taught masters programme or pursue your own line of investigation, we offer a dynamic academic environment, supported by excellent facilities.

We have an outstanding reputation for mathematics teaching and research. We were judged 'excellent' in the most recent Teaching Quality Assessment. In the Research Excellence Framework (REF) 2014 we had 85 per cent of our research in mathematical sciences rated either 4* world leading or 3* internationally excellent.

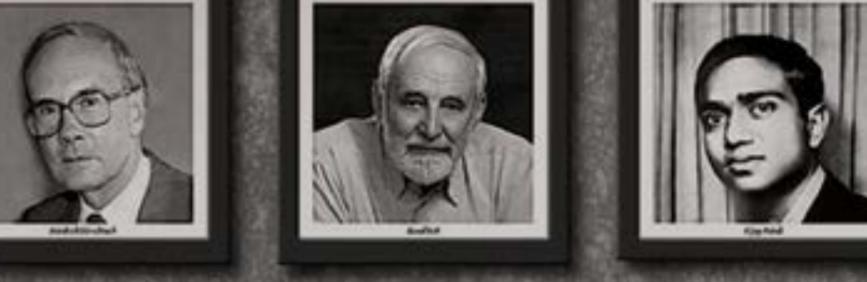
Rich heritage

The School boasts a rich heritage in pioneering mathematics. Our base, the James Clerk Maxwell Building, is named after one of the most celebrated mathematicians to study at the University. The 19th-century scientist is most famous for developing classical electromagnetic theory.

Leaders in their fields

Our status as one of the most prestigious schools in the UK for mathematics attracts highly respected staff. Many of our 90 current academics are leaders in their fields and have been recognised with international awards.

The School is home to two Fellows of the Royal Society, 14 Fellows of the Royal Society of Edinburgh and seven Philip Leverhulme Prize or Fellowship holders. Recent prize recipients include Agata Smoktunowicz (European Mathematical Society Prize), Clark Barwick (London Mathematical Society Berwick Prize) and Nick Sheridan (London Mathematical Society Whitehead Prize).



Facilities and resources

You will enjoy excellent facilities, ranging from one of the world's major supercomputing hubs to generous library provision for research at the leading level, including the Noreen and Kenneth Murray Library at King's Buildings.

You will have access to more than 1,400 computers in suites distributed across the University's sites, many of which are open 24 hours a day. In addition, if you are a research student, you will be provided with your own workspace with desk and desktop computer. In Year 1, our PhD students will share common space within the new Bayes Centre in the Central Area of Edinburgh. This provides an exciting interdisciplinary data science environment with our partners from the Maxwell Graduate School.

Software support

We provide all our mathematics postgraduates with access to software packages such as Maple, Matlab and Mathematica. Research students are allocated parallel computing time on 'Eddie' – the Edinburgh Compute and Data Facility. It is also possible to arrange use of the BlueGene/Q supercomputer facility if your research requires it.

In good company

Mathematics is a discipline of high intellect with connections stretching across all the scientific disciplines and beyond, and in Edinburgh you can be certain of thriving in a rich academic setting. Our School is one of the country's largest mathematics research communities in its own right which includes around 60 active research students. You will also benefit from Edinburgh's high-level collaborations, both regional and international. These include the International Centre for Mathematical Sciences and our close collaboration with Heriot-Watt University through the Maxwell Institute, which was set up in 2005 following significant funding from the Scottish Funding Council.

Research students will have a primary and secondary supervisor and the opportunity to network with a large and varied peer group. You will be carrying out your research in the company of eminent figures and be exposed to a steady stream of distinguished researchers from all over the world.

Collections of the University

The University of Edinburgh has one of the world's great collections, which has been growing ever since its foundation in 1583. Our collections include rare books, archives and manuscripts, art, historical musical instruments and a wide range of museum objects from geological specimens to anatomical models. If laid out end to end, we would have almost 60 kilometres of shelving and storage space devoted to our heritage material, from 1st-century Greek papyrus fragments to new works of sculpture. This is curated by specialist staff across 45 sites and used for our teaching and research and by the wider public community.

The Centre for Research Collections in the Main Library is the hub for all our collections, where specialist curators make them available for study, research and pleasure. Postgraduate students are welcome to study original objects and have made many important research discoveries while working on the archives. You will find an incredible range of material in our collections that is available nowhere else in the world.

"I experienced an egalitarian professor-student relationship and felt that student feedback was considered carefully. A number of external guest lecturers from diverse backgrounds in industry and academia enriched the programme with their expertise."

Michel Zedler, MSc Operational Research

Community

We are a vibrant community of more than 50 academic and related staff supervising 60 research students, and many more MSc students. While you will be immersed in academic discourse at the highest level, we also offer plenty of opportunities to make new connections, through a full calendar of social events.

You'll have the chance to meet people through the daily bustle of the MSc Hub common room, subject-specific clubs, the weekly postgraduate colloquium – where students give talks and share cake – and at many annual events, including a residential excursion to Firth Point on the banks of Loch Tay in Perthshire, where everything from cycling to canoeing is on offer.

There are opportunities to get involved with our new blog *Blogarithms*, which is written for the School by our students. We also have a talented team of staff and students working on a busy calendar of outreach activities, including the annual Edinburgh International Science Festival. They demonstrate to the wider community that maths is a beautiful, elegant and creative subject, which underpins a huge amount of modern society.

Graduate School

For research students, our Graduate School offers a busy schedule of activities ranging from formal seminars to social events. The Graduate School runs its own website and YouTube channel, which features self-produced videos of lectures.

Share your work with the world

Researchers are encouraged to travel and participate in conferences and seminars. You'll also be in the right place in Edinburgh to meet distinguished researchers – from all over the world – who are attracted to conferences held at the School, and the various collaborative centres based here. You'll find opportunities for networking that could have far-reaching effects on your career in mathematics.

“The School is very supportive in organising social events to help networking. Edinburgh is an international university that attracts students from different countries. I've made useful contacts with academics within the University and with external experts in the field.”

Sarah Farid Khwaja, PhD Mathematics



Employability and graduate attributes

While your research will build your knowledge and skills in your chosen field, throughout your programme you'll also gain expertise and confidence in a number of related areas, such as public speaking, presentation and written communication.

This personal and professional development, supported by services offered by the School and the University, will give you an edge when applying for academic or commercial roles.

Student Learning Advisor (SLA)

Your SLA is available to help to offer help and advice on a range of issues connected to your taught postgraduate studies. They may also contact you if the School has concerns about your progress so we can work together to ensure you achieve your full potential. The SLA is the first person to contact if, for any reason, you are not doing as well as you hoped. In addition to your individual meetings with your Personal Tutor, you will have a number of activities with the SLA as part of our personal development programme. This is designed to support your development and your academic progress, career planning and skills development.

Institute for Academic Development

All postgraduate students can benefit from our Institute for Academic Development (IAD), which provides information, events and courses to develop the skills you will need throughout your studies and in the future. IAD events also offer the perfect opportunity to meet and network with other postgraduates from across the University.

Further information is available online:
www.ed.ac.uk/iad/postgraduates

For taught postgraduates, IAD provides a popular study-related and transferable skills support programme. It is designed to help you settle into postgraduate life, succeed during your studies and move confidently to the next stage of your career. We offer on-campus and online workshops and one-to-one study skills consultations, plus online advice and learning materials. Workshops and learning resources cover key topics tailored to different academic stages, including: pre-arrival sessions; getting started with your studies; critical reading, writing and thinking; managing your exams; and planning for and writing up your dissertation.

IAD also provides a comprehensive programme of transferable-skills training, resources and support for researchers completing a doctorate. The workshop programme is designed to help you successfully prepare for the various milestones of your PhD, from getting started with your research, to writing up and preparing for the viva, as well as developing personal and professional skills that can be transferred to your future employment. Workshops cover topics such as writing skills, reference management tools, statistics, preparing for conferences, delivering presentations, time and project management, and personal development. IAD also offers online resources and planning tools to help get your research started, as well as support for tutoring and demonstrating, and public engagement and communication.

Careers Service

Our Careers Service plays an essential part in your wider student experience at the University, offering a range of tailored careers and personal development guidance and support. We support you to recognise the wealth of possibilities ahead, while at university and after graduation, helping you explore new avenues, tap into your talents and build your employability with confidence and enthusiasm. We provide high-quality, tailored support to all students. From exploring career options to making decisions, from CV writing to interview practice, from Employ.ed internships to graduate posts and from careers fairs to postgraduate alumni events, we will help you prepare for the future. We sustain and continually develop links with employers from all industries and employment sectors, from the world's top recruiters to small enterprises based here in Edinburgh. Our employer team provides a programme of opportunities for you to meet employers on campus and virtually, and advertises a wide range of part-time and graduate jobs.

More information:
www.ed.ac.uk/careers/postgrad

Platform One

Platform One is an online meeting place where members of the University community, past and present, can gather. It aims to provide a supportive environment where students, alumni, staff and volunteers can share knowledge and experiences. Together, we form a single community that meets on Platform One. Join us and find out more about the people and possibilities. More information: www.ed.ac.uk/platform-one

Backing bright ideas

Edinburgh Innovations, the University's commercialisation service, offers free support to student entrepreneurs including one-to-one business advice and a range of workshops, bootcamps, competitions and networking events. Successful recent clients include David Hunter, inventor of the performance-tracking golf watch Shot Scope; Orfeas Boteas, creator of the Dehumaniser sound effects software used by Hollywood movies and blockbuster video games; and Enactus Edinburgh, a team of student social entrepreneurs who represented the UK in the Enactus World Cup with their local and international projects.

Learn to teach

PhD students are given leadership roles within the School, and you'll have the opportunity to spend some of your time conducting undergraduate tutorials. We'll help you with this: the University offers courses in public speaking and other teaching skills, and you'll be able to draw on the support of your peers and supervisors in research group meetings.

A solid start

For research students, a strong foundation in the fundamentals of your chosen field is essential and in the early part of your studies you'll be offered taught courses through the Scottish Mathematical Sciences Training Centre, a consortium of seven mathematics departments. You'll take part in video-conferenced lectures, presented by staff from all participating universities.

Applications and fees

We have an online application process for all postgraduate programmes. It's a straightforward system with full instructions, including details of any supporting documentation you need to submit.

When applying, you will set up an account, which lets you save your application and continue at another time.

Full guidance on our application system is available at: www.ed.ac.uk/postgraduate/applying

General requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/graduate-entry), in mathematics or another mathematical subject or numerate discipline.

You will also need to meet the University's language requirements (see below). Entry requirements for individual programmes can vary, so check the details for the specific programme you wish to apply for.

To apply for a research degree you will need a UK first class honours degree, or its international equivalent, in an appropriate subject; or a UK 2:1 honours degree plus a UK masters degree, or their international equivalents; or relevant qualifications and experience.

References

For applications to taught programmes, the normal requirement is one reference, although an additional reference may be requested in individual cases. For applications to research programmes, two references are required. You should check the entry online for exact requirements for your intended programme of study. For general guidance on references, visit: www.ed.ac.uk/postgraduate/references

Deadlines

Taught programmes

Some programmes have application deadlines. Please check the programme entry online for details. For all other programmes, you are encouraged to apply no later than one month prior to entry to ensure there is sufficient time to process your application. However, earlier application is recommended, particularly where there is a high demand for places or when a visa will be required. Should you wish to submit a late application, please contact us for guidance. If you are applying for funding, in most cases you will need an offer to study with us before you can make your funding application.

Research programmes

The early deadline for applications is 30th November 2019 and the regular deadline is 31st January 2020. This will enable you to be considered for all of our available funding opportunities. Early applications are encouraged and a limited number of early offers may be made. Late applications will be considered, but priority will be given to applications received by the deadline.

English language requirements

You must demonstrate a level of English language competency at a level that will enable you to succeed in your studies, regardless of your nationality or country of residence. We accept the following English language qualifications at the grades specified:

- IELTS Academic: total 6.5 (at least 6.0 in each module).
- TOEFL-iBT: total 92 (at least 20 in each module).
- PTE Academic: total 61 (at least 56 in each of the Communicative Skills sections).
- CAE and CPE: total 176 (at least 169 in each module).
- Trinity ISE: ISE II (with distinctions in all four components).

Please note:

- English language requirements can be affected by government policy so please ensure you visit our degree finder to check the latest requirements for your programme: www.ed.ac.uk/postgraduate/degrees
- Your English language qualification must be no more than three and a half years old at the beginning of your programme, unless you are using IELTS, TOEFL, PTE Academic or Trinity ISE, in which case it must be no more than two years old.

- We also accept recent degree-level study that was taught and assessed in English in a majority English-speaking country (as defined by UK Visas & Immigration), or at a university in a non-majority English-speaking country which has specifically been approved by the University of Edinburgh's Admissions Qualifications Group. A list of approved universities is published on our website. If you are not a national of a majority English speaking country, then your degree must be no more than three and a half years old at the beginning of your programme of study.

- We do not require you to take an English language test before you apply.

Please contact the Graduate School Administrator for specific details: pgresearch@maths.ed.ac.uk

Abbreviations: IELTS – International English Language Testing System; TOEFL-iBT – Test of English as a Foreign Language Internet-Based Test; PTE – Pearson Test of English; CPE – Certificate of Proficiency in English; CAE – Certificate in Advanced English; Trinity ISE – Integrated Skills in English.

www.ed.ac.uk/english-requirements/pg

Tuition fees

The following table provides an overview of indicative fee levels for programmes commencing in 2020.

Please note:

- International students starting full-time taught programmes of study lasting more than one year will be charged a fixed annual fee.
- All other students on full-time and part-time programmes of study lasting more than one year should be aware that annual tuition fees are subject to revision and are typically increased by approximately five per cent per annum. This annual increase should be taken into account when you are applying for a programme.
- In addition to tuition fees, your programme may be subject to an application fee and additional costs/programme costs may apply. Please check the latest programme information online.

Asylum seeker tuition fee status and scholarship

Information for applicants seeking asylum from within the United Kingdom, who wish to commence a programme of study at the University in 2020, is available online. This includes our tuition fee rates and scholarship opportunities: www.ed.ac.uk/student-funding/asylum

Tuition fees for EU students

EU students enrolling in the 2020/21 academic year will be admitted as Scottish/EU fee status students. Taught masters students will be eligible for the same tuition support as Scottish domiciled students from the Student Awards Agency Scotland (SAAS).

For UK/EU students

	Annual fee
Taught programmes 1-year FT	£13,000
Taught programmes 2-years PT	£6,500
Taught programmes 3-years PT	£4,340
Except:	
Computational Mathematical Finance, Financial Modelling & Optimization 1-year FT	£25,950
Computational Mathematical Finance, Financial Modelling & Optimization 2-years PT	£12,975
Financial Mathematics 1-year FT	£21,296*
Computational Applied Mathematics 1-year FT	£10,800
PhD 3- or 4-years FT	£4,327*
PhD 6-years PT	£2,164*

For international students

	Annual fee
Taught programmes 1-year FT	£23,950
Except:	
Computational Mathematical Finance, Financial Modelling & Optimization 1-year FT	£30,300
Financial Mathematics 1-year FT	£24,840*
PhD 3- or 4-years FT	£20,100

* Figure shown is the 2019/20 fee level
All other fees quoted are indicative of 2020/21 fee levels. Because these figures are indicative, it is important you check online before you apply and check the up-to-date fee level that will apply to your specific programme: www.ed.ac.uk/student-funding/tuition-fees/postgraduate



Funding

A large number of scholarships, loans and other funding schemes are available for your postgraduate studies. It is only possible to show a small selection in print. To see the full range, please visit: www.ed.ac.uk/student-funding/postgraduate

Awards are offered by the School of Mathematics, the College of Science & Engineering, the University of Edinburgh, the Scottish, UK and international governments and many funding bodies. Some of these offer our PhD students financial support for three and a half years, and MAC-MIGS does so for four years, to cover both the training and PhD writing periods.

Here we list a selection of potential sources of financial support for postgraduate students applying to the School of Mathematics. This list was correct at the time of printing but please check the full and up to date range online (see above) and because new funding sources can become available please do keep checking. The School aims to help find scholarships covering tuition and living expenses for all our PhD students.

University of Edinburgh Alumni Scholarships

We offer a 10 per cent scholarship towards postgraduate fees to all alumni who graduated from the University as an undergraduate, and to all students who spent at least one semester studying at the University on a visiting programme: www.ed.ac.uk/student-funding/alumni-scholarships

Key

- Taught masters programmes
- Masters by Research programmes
- Research programmes

Scholarships at the University of Edinburgh

• China Scholarships Council/University of Edinburgh Scholarships (China) ●

A number of scholarships for PhD study to candidates who are citizens and residents of China. Participating schools to be confirmed: www.ed.ac.uk/student-funding/china-council

• Edinburgh Global Research Scholarships ●

These scholarships are designed to attract high-quality international research students to the University: www.ed.ac.uk/student-funding/global-research

• EPSRC, MAC-MIGS and School of Mathematics Studentships ●

All PhD applications will be considered automatically for School of Mathematics studentships. All UK PhD applicants will also be considered automatically for EPSRC DTG funding: edin.ac/math-pg-funding

All students with interests in mathematical modelling, analysis and computation are encouraged to consider the MAC-MIGS programme which benefits from its own funding and offers 15 fully-funded places a year: www.mac-migs.ac.uk

• Principal's Career Development PhD Scholarships ●

These provide a valuable opportunity for PhD students to undertake training and skills development and offer opportunities in areas such as teaching, public engagement, entrepreneurship, data science, and research. Each award covers the UK tuition fee and a stipend: www.ed.ac.uk/student-funding/development

• School of Mathematics MSc funding ●

Full and partial School funding of tuition fees and contributions to living expenses is awarded on merit. Select programme from: msc.maths.ed.ac.uk

Research council awards

Research councils offer awards to masters and PhD students in most of the Schools within the University of Edinburgh. All studentship applications to the research councils must be made through the University, through your School or College office. Awards can be made for both taught and research programmes.

Normally only those UK/EU students who have been resident in the UK for the preceding three years are eligible for a full award. For some awards, candidates who are EU nationals and are resident in the UK may be eligible for a fees-only award. The UK Government has confirmed that EU postgraduate research students commencing their studies in 2020/21 will retain their fee status and eligibility for research council support for the duration of their programme: www.ed.ac.uk/student-funding/research-councils

The University also offers a number of scholarships in partnership with the following overseas government agencies:

• Mexico ●

Banco de Mexico and the Banco de Mexico's FIDERH trust (FIDERH): ●●● www.fiderh.org.mx

• Fundacion Mexicana para la Educacion, la Tecnologia y la Ciencia (FUNED): ●● www.funedx.org

• Pakistan ●

Higher Education Commission, Pakistan (HEC): www.hec.gov.pk

Loans available for study at the University of Edinburgh

The University of Edinburgh is a participating institution in the following loans programmes, meaning we certify your student status and can help with the application process.

• The Canada Student Loans Program ●●●

The University is eligible to certify Canadian student loan applications: www.ed.ac.uk/student-funding/canadian-loans

• Erasmus+ ●

The Erasmus+ Master Loan helps masters students with their living and tuition costs when studying in an Erasmus+ country other than where they live or where they took their first degree. For more information: erasmusplus.org.uk/master-loan

• Postgraduate Doctoral Loans England ●

Student Finance England offers postgraduate loans for doctoral study, payable to eligible students and divided equally across each year of the doctoral programme: www.gov.uk/doctoral-loan

• Postgraduate Doctoral Loans Wales ●

Student Finance Wales offers loans for postgraduate doctoral study, payable to eligible students, divided equally across each year of the doctoral programme: www.studentfinancewales.co.uk/postgraduate-students/postgraduate-doctoral-loan

• Postgraduate Loans (PGL) England ●●

Student Finance England offers postgraduate loans for taught and research masters programmes, payable to eligible students: www.gov.uk/postgraduate-loan

• Postgraduate Loans (PGL) Northern Ireland ●●

Student Finance Northern Ireland offers eligible students a tuition fee loan for taught and research programmes, at certificate-, diploma-, and masters-level, which will be paid directly to the University: www.studentfinancenir.co.uk

• Postgraduate Loans (SAAS) Scotland and EU ●●

The Student Awards Agency Scotland offers eligible students tuition fee loans for taught and research programmes at diploma and masters level, which will be paid directly to the University. Full-time students resident in Scotland can also apply for a non-income assessed living cost loan: www.saas.gov.uk

• Postgraduate Master's Finance Wales ●●

Student Finance Wales offers eligible students postgraduate finance for taught and research masters programmes: www.studentfinancewales.co.uk

• US Student Loans ●●●

The University is eligible to certify loan applications for US loan students. Full details on eligibility and how to apply can be found online: www.ed.ac.uk/student-funding/us-loans

Other sources of funding

The following are examples of the many scholarships and support schemes available to students from particular countries who meet certain eligibility criteria.

• Chevening Scholarships ●●

A number of partial and full funding scholarships are available to one-year masters students: www.chevening.org

• Commonwealth Scholarships ●●●

Scholarships available to students who are resident in any Commonwealth country, other than the UK: www.dfid.gov.uk/cscuk

• Marshall Scholarships (USA) ●●●

Scholarships available to outstanding US students wishing to study at any UK university for at least two years: www.marshallscholarship.org

“The Scottish Government’s initiative to attract international students through the Saltire Scholarship Scheme, as well as the University of Edinburgh’s help and support for international students, has helped provide me with an opportunity that I would never have conceived of prior to starting my studies at Edinburgh.”

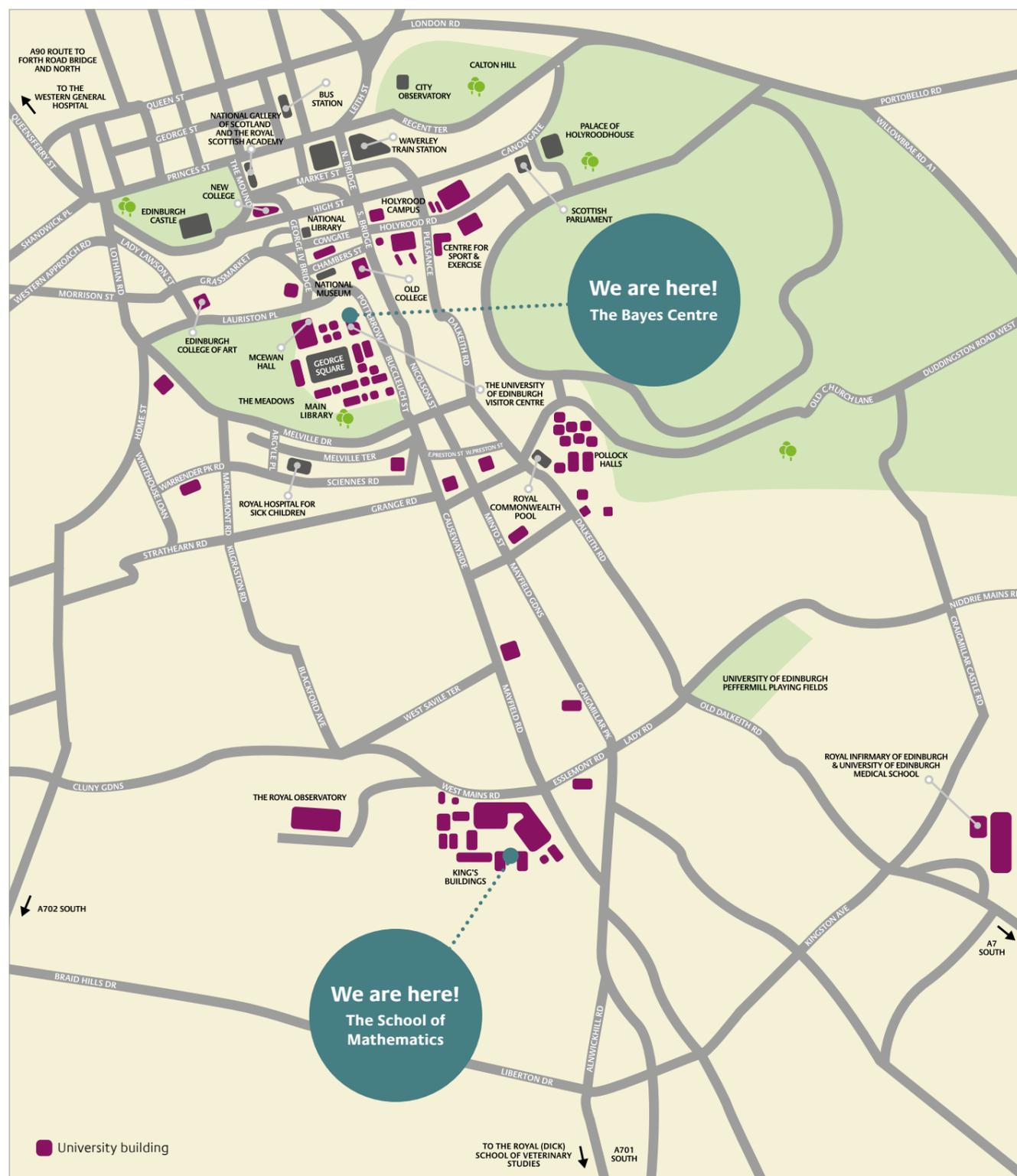
Robert Starr, MSc High Performance Computing, Scotland’s Saltire Scholarship

Campus map

The School of Mathematics is situated in the James Clerk Maxwell Building at the University's King's Buildings campus, which is about two miles south of the city centre and well served by buses.



Detailed maps can be found at:
www.ed.ac.uk/maps



Get in touch

Contact us

For more information on our taught MSc programmes, please email:

Computational Applied Mathematics

cammsc@ed.ac.uk

Computational Mathematical Finance

cmfmsc@ed.ac.uk

Financial Mathematics

macspenquiries@hw.ac.uk

Financial Modelling & Optimization

fmomsc@ed.ac.uk

Operational Research

ormsc@ed.ac.uk

Statistics & OR/with Data Science

statsmsc@ed.ac.uk

For more information about the application and admissions process for taught MSc programmes, contact:

College of Science & Engineering

Recruitment and Admissions Team

Tel: +44 (0)131 650 5737

www.ed.ac.uk/science-engineering/contact/undergraduate-or-postgraduate-taught-enquiries

For more information on postgraduate research, contact:

Graduate School Administrator

Tel +44 (0)131 650 5085

Email pgresearch@maths.ed.ac.uk

For MAC-MIGS information, please visit:
www.mac-migs.ac.uk

Visit us

The University's Postgraduate Open Day is your opportunity to come and meet current staff and students. Our next campus-based Open Day takes place on 13 November 2019. For more information, visit: www.ed.ac.uk/postgraduate-open-day

If you are interested in visiting the School outside the Open Day system as an individual, you are encouraged to contact any relevant member of staff directly to arrange a meeting or an informative video chat. Larger groups should contact the School to arrange a visit: queries@maths.ed.ac.uk.

Our visits to you

If you are unable to visit the University, we attend events throughout the year so you can meet and speak to us in person.

UK and Europe: www.ed.ac.uk/postgraduate/events

International: www.ed.ac.uk/international/our-visits-overseas

Chat online

We offer all postgraduate students online information sessions. To find out more and see when the next session will be: www.ed.ac.uk/postgraduate/online-events

For international students, Edinburgh Global also offers regular online chats. To find out more: www.ed.ac.uk/international/chat-to-us-online



This publication is available online at www.ed.ac.uk/postgraduate and can be made available in alternative formats on request. Please contact communications.office@ed.ac.uk or call +44 (0)131 650 2252.

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We have made every effort to ensure the accuracy of the information in this prospectus before going to print. However please check online for the most up-to-date information: www.ed.ac.uk

On 23 June 2016 the UK electorate voted in a national referendum to leave the European Union. EU postgraduate taught students enrolling in the 2020/21 academic year will be admitted as Scottish/EU fee status students and eligible for the same tuition support as Scottish domiciled students for the duration of their studies. This will still be the case in the event of a Brexit no deal scenario. For the latest information for students and applicants from the EU, please visit our website: www.ed.ac.uk/news/eu

The University's standard terms and conditions will form an essential part of any contract between the University of Edinburgh and any student offered a place here. Our full terms and conditions are available online: www.ed.ac.uk/student-recruitment/terms-conditions

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