School of **Mathematics**

Undergraduate Degree Programmes
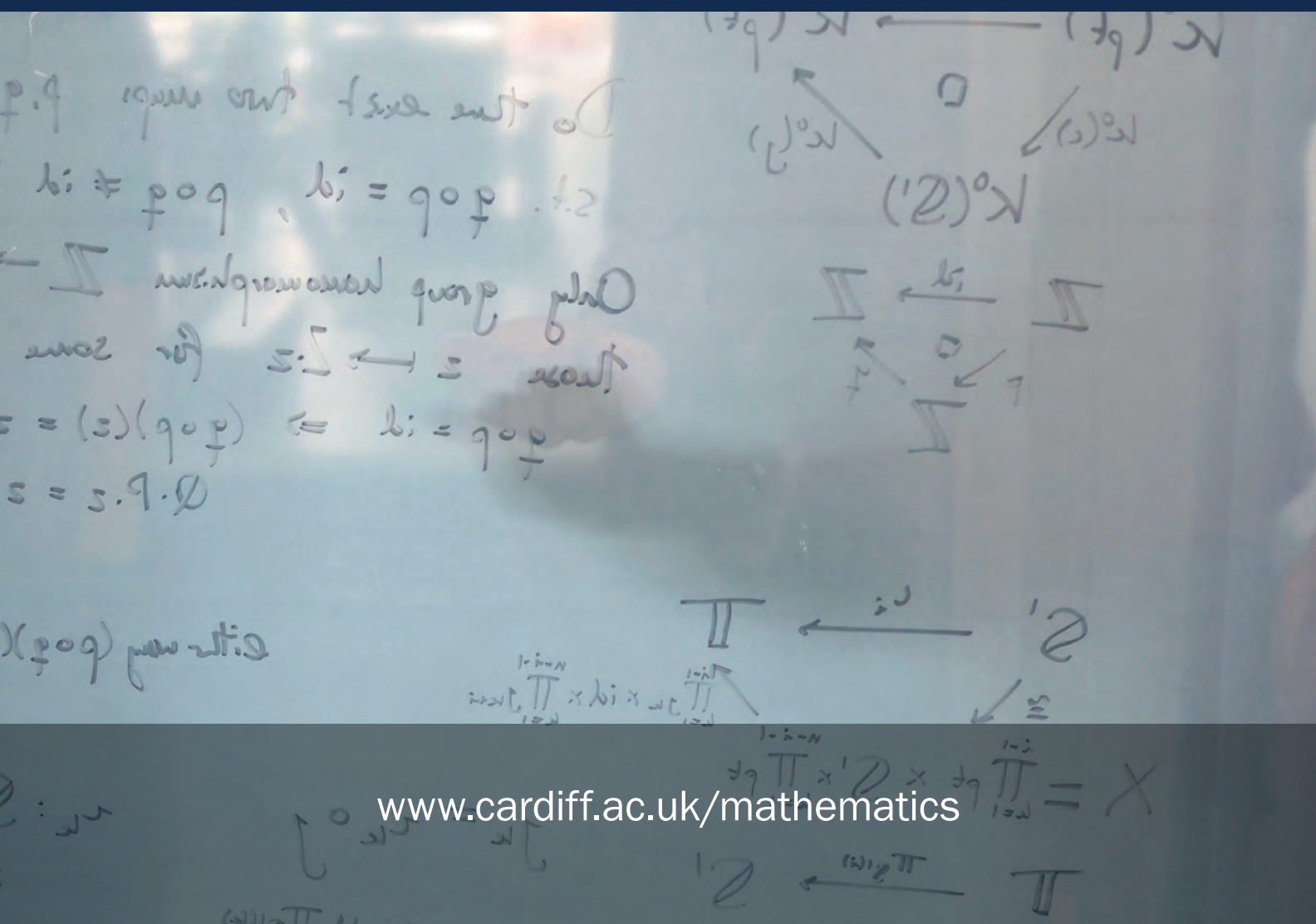
www.cardiff.ac.uk/mathematics

Our excellent reputation and international vision attracts over **200 undergraduate students** from around the world every year.

Accredited by the Institute of Mathematics and its Applications (IMA).

Our teaching is centred on pioneering research and the needs of modern technology.

Welcome

We're thrilled that you're considering Cardiff for your next adventure in the world of mathematics.

At Cardiff's School of Mathematics, you'll have access to some of the best mathematicians in the country, a cutting-edge research community and a huge array of courses to choose from.

Now, picture yourself in our new, modern building, Abacws. Filled with spaces designed for teamwork and innovation, we're all about hands-on learning and making maths come alive.

Our students? They're over the moon about the incredible learning journey they embark on here at Cardiff. In fact, our student satisfaction rates have been increasing with our BSc Financial Mathematics course achieving 100% satisfaction in 2023. Our academics are maths heroes who are pushing the boundaries of what's possible in the world of numbers, formulae and applications. They're all about making maths not just relevant but revolutionary in the modern world.

Your undergraduate degree will be a substantial step towards your future career. We have a wide variety of modules for you to choose from, so you can tailor to your interests and career goals, in addition to a range of facilities and support services to help you along the way. You can also dive into a maths placement or embark on a year abroad with one of our partner institutions – the opportunities are endless.

So, on behalf of the whole team at the School of Mathematics, we're not just wishing you success – we're gearing up for a maths adventure with you. Got questions? Reach out anytime. We're here to turn your maths dreams into a reality.

One of the **strongest** professional development programmes for undergraduates in the UK.

Dr Jonathan Thompson
Head of School

Find out more

About our school

Our teaching

Staff in the School of Mathematics are committed to high quality in-person teaching. We support our students to fulfil their maximum potential, both during their degree schemes and by preparing them for exciting futures.

Our programmes are intellectually exciting and flexible, allowing students to follow their mathematical interests and develop their professional and mathematical skills.

Our research

As a Russell Group University, we're committed to maintaining the very best research, an outstanding teaching and learning experience and strong links with industry.

In the 2021 Research Excellence Framework, the research at Cardiff School of Mathematics was rated as internationally excellent or world leading.

Our facilities

Abacws is a building designed in collaboration with students and lecturers to create interdisciplinary, flexible and creative workspaces, with innovative teaching areas and practices for the School of Mathematics.

The facilities include:

- Flexible lecture theatres and seminar rooms with innovative layouts to encourage interaction.
- Dedicated spaces for student project work.
- Computer labs designed to enable group work as well as classes and individual study.
- Spaces open to our industrial partners to enable excellent engagement opportunities for our students.
- New simulated Trading Room for financial mathematic.

Our location

The school is situated in the Abacws building, located in a central position within the University campus, yet within five minutes walking time of the main city shopping complex and Cardiff Civic Centre. See the map on page 19.

Take a look at the Abacws building and its facilities

Your learning journey

Types of degree programmes

BSc programme
A maths degree completed over three years.

MMath and MMORS programme
Specialist programmes providing deeper knowledge and a greater exposure to research compared to the BSc degree. These programmes are completed over four years.

Year in industry programme
A professional placement year extending the three-year BSc degree programme to four years and the four-year MMath and MMORS degree programmes to five years.

Year abroad programme
A year abroad extends the three-year BSc degree programme to four years and the four year MMath and MMORS degree programmes to five years.

Mathematics and music joint honours degree
Split equally between two schools, the joint honours programme involves the study of both music and maths. This programme runs over three years.

Professional placement year

Develop your employability skills by completing a year working in industry.

In a competitive graduate job market, a placement can help you gain extra skills and experience to make you stand out from the crowd.

We have links with over 300 institutions and can provide you with the opportunity to embark on a placement across the world. Our students have completed exciting placements in organisations like:

- HM Revenue and Customs (London)
- Ministry of Defence (Warminster)
- Office for National Statistics (Newport)
- Welsh Government (Cardiff)
- Barclaycard (Northampton)
- Lloyds Banking Group (Cardiff, Bristol and London)
- PricewaterhouseCoopers (various locations)
- BAE Systems (Bristol)
- Corus (Newport)
- GSK (Greenford and Harlow)
- National Air Traffic Services Ltd (Southampton)
- Roche Pharmaceuticals (Welwyn Garden City)
- Rolls Royce (Derby)

Your placement will last typically between 10-12 months and will take place between the second and third year of your degree.

Our school has a dedicated Placement Officer who will help you find and apply for suitable placement opportunities. They will also prepare you for the workplace through a series of personal development workshops during your second year.

"I am just returning from a placement as a biostatistician in a pharmaceutical company. When finding a placement, the careers team sent out lists of potential placements, and offered lots of help with sorting CVs and practicing for interviews. I ended up loving the placement straight away and now I've found a career path to work towards.

Osy Dallimore, mathematics operational research and statistics (BSc) student

Immerse yourself in another culture and language with a year abroad experience.

Year abroad programme

Our numerous partnerships with top universities means you can study in some of the most iconic and inspiring cities in the world. Destinations include Paris, Berlin, Milan and Barcelona, as well as many other universities further afield in the United States, Australia, Canada and Hong Kong.

Your placement will last one academic year (this will vary depending on your chosen location) and will take place between the second and third year of your degree.

You don't need to commit to a university abroad until the start of your second year, so there's plenty of time to change your mind if you're not ready to commit just yet.

The Global Opportunities Team provides a dedicated resource and source of expertise for all of the international opportunities available at Cardiff University. They can support you with the application process if you are considering a period of time abroad to study, work or volunteer and offer a range of international opportunities.

> **"** I really liked the freedom of the course and they have really good opportunities to study and work abroad. My best experience was living and working in France and Switzerland, including 6 months' work at CERN. I cycled to work every day looking at Mont Blanc – it was amazing.
>
> **Rhys Ward, mathematics (BSc) student**

Find out more

Our degree programmes

Mathematics

Mathematics (BSc)
Duration: **3 years**
UCAS Code: **G100**

Mathematics with Year Abroad (BSc)
Duration: **4 years**
UCAS Code: **G103**

Mathematics with Professional Placement (BSc)
Duration: **4 years**
UCAS Code: **G105**

Mathematics (MMath)
Duration: **4 years**
UCAS code: **G101**

Mathematics with Year Abroad (G104)
Duration: **5 years**
UCAS code: **G104**

Mathematics with Professional Placement (G112)
Duration: **5 years**
UCAS code: **G112**

A mathematics degree from Cardiff provides you with core mathematical skills, that will equip you for a variety of careers, and gives a strong basis for further study.

The three-year course provides a broad background in applied mathematics, statistics, computing and operational research. As you move through the course, you will gain academic independence, moving from small group teaching in your first year, through to an optional independent project in your final year. In most cases, you will have the option to switch courses at the end of your first year, so you can keep your options open when you apply. You will also have the opportunity to complete a professional placement year or a year abroad after your second year.

The four-year MMath shares the same core as our BSc in mathematics but enables you to explore your areas of interest in greater depth, through optional modules, specialised year four modules and via a substantial research project. This course provides the ideal preparation for high-level entry into relevant professions and is also a solid base for pursuing a research career. In year four, you will complete a major piece of project work which could include:

- A survey of an existing area of mathematical theory not covered in taught modules
- An introductory research project
- The development of a piece of mathematical software

Not only will you explore a research topic of your choice, but you will also develop the professional skills that graduate employers are looking for. You will also demonstrate that you are at the forefront of the discipline through extensive coverage of topics in the school's main research areas, such as mathematical analysis, mathematical physics and fluid dynamics.

The most up-to-date module information can be found on our website at: **www.cardiff.ac.uk/courses**
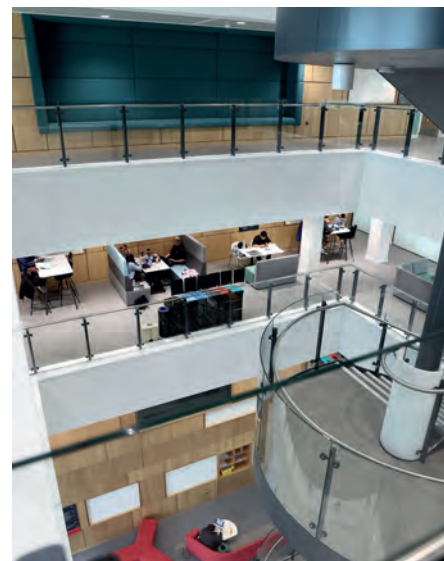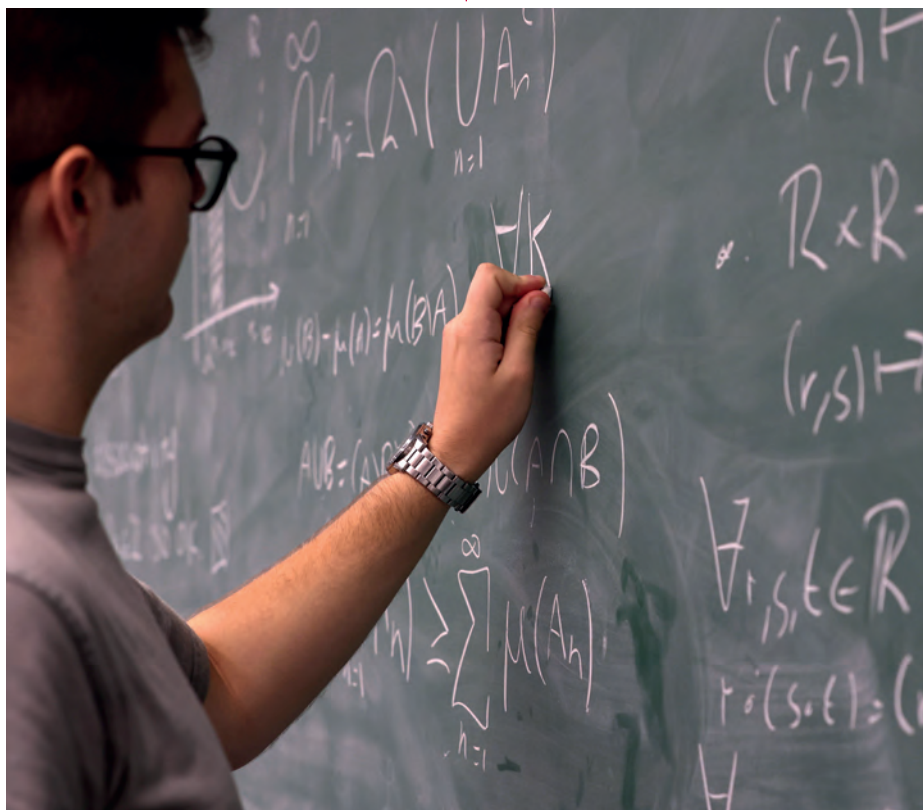
Hear from one of our students:

Aurora Birkeland, mathematics (MMath) student

This course will provide me with transferable skills for future careers

I'm studying an integrated masters in mathematics. I chose to do a degree in mathematics mostly because I have a genuine passion for the subject and could envision myself truly enjoying it at university. Before I applied to university, I was also unsure of what I wanted to do post-graduation, so I liked how mathematics would give me transferable skills and flexibility for my future career path.

### I've received support from lots of facilities within the School of Mathematics

The libraries have been invaluable during exam season, providing both a great, quiet study environment and access to relevant course materials. Also, the newly opened Abacws building has become our favourite spot both for private study and for collaboration. Additionally, the building's computer labs have been helpful for our programming-focused assignments.

Throughout my three years at Cardiff, the career service has provided extensive support

They've helped me with various aspects, including reviewing my CV, conducting mock interviews, and offering valuable insights into my career path. The maths careers service alerted me to opportunities while I was a student, leading me to discover internships and work experiences that I might not have found otherwise.

My main piece of advice is to make use of all the opportunities

While you're at Cardiff University, make good use of all the help and opportunities they provide, especially in the maths department. This will help you to do well in your studies, meet people, and have a great time at university!
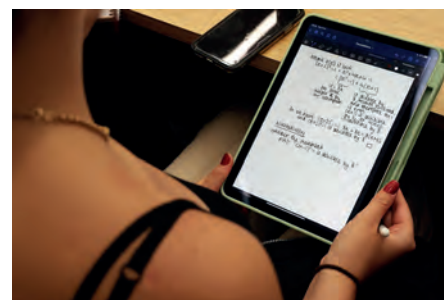
Our degree programmes

Financial mathematics

Financial Mathematics (BSc)
Duration: **3 years**
UCAS Code: **15R4**

Financial Mathematics with Year Abroad (BSc)
Duration: **4 years**
UCAS Code: **15R5**

Financial Mathematics with Professional Placement (BSc)
Duration: **4 years**
UCAS code: **15R6**

This course is designed to provide you with the core mathematical skills directed towards a career in finance, banking and insurance.

To manage the complex financial sector, banks and financial institutions need talented mathematicians who are fluent in the language of finance.

This course will provide you with a solid foundation in general mathematical theory and techniques, whilst also developing knowledge and skills that are essential for jobs in the finance industry.

You will gain an understanding of modern financial markets, institutions, investments and policies, with a focus on issues and topics relevant to the computational and market design side of contemporary finance, including:

- Complex systems
- Trading (in particular high-frequency trading)
- Fund management
- Analytics

The BSc in financial mathematics also offers a good grounding in general mathematical theory and techniques.

In most cases, you will have the option to switch courses at the end of your first year, so you can keep your options open when you apply.

You will also have the opportunity to complete a professional placement year or a year abroad after your second year.

The most up-to-date module information can be found on our website at:
www.cardiff.ac.uk/courses
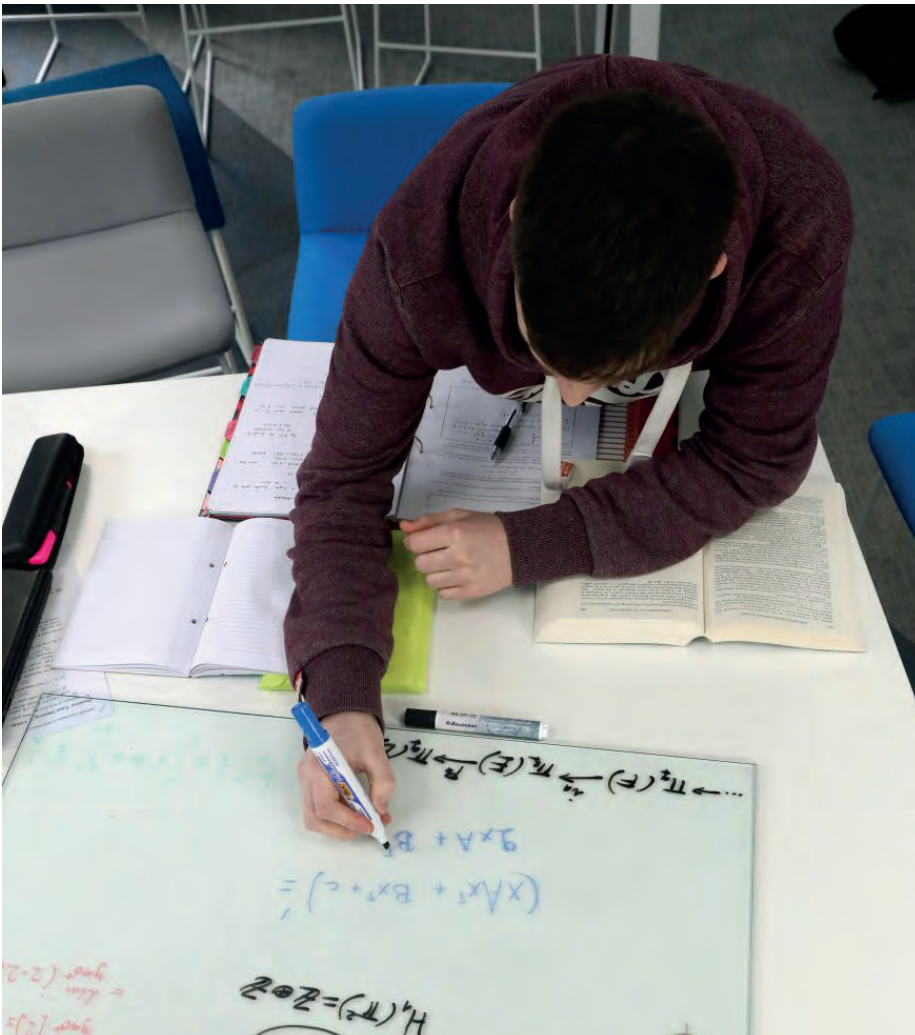
Hear from one of our students:

Lauren Oakes,
financial mathematics (BSc) student

I'm interested in how maths can be used in the real world

I chose financial mathematics as I've always been interested in how maths can be used in the real world, and the finance industry is a great example of this. I also wanted to focus on a specific area so this course was a perfect fit for me. Additionally, I chose a course with a placement year to give me experience and make it easier for me to find a job after university.

I like the diversity that comes with studying mathematics

On a mathematics course you do so many different modules that span across pure mathematics, statistics, mechanics and finance, and even combinations of these. This means that you're never bored and there is so much choice that whatever you become interested in or whatever you want to specialise in, there'll be an option you can choose. At Cardiff University there is also a large range of programming and computing modules to choose from, which is very useful for jobs and looks great on a CV.

Financial mathematics is great because it opens so many doors to your future

Doing a maths degree you can learn so many useful skills like analytical thinking, problem solving, coding and programming, critical thinking and many more. Having a maths degree under your belt when you leave university, especially with the skills and expertise listed above, your options are endless. Of course, maths is a challenging course and you'll need to work hard, but it's more than worth it in the end.

You can meet people who have used maths to build their careers

Throughout your time at university there are many different lectures, seminars, talks and careers fairs, so that you can meet people who have used maths to build their careers, and you can gather inspiration to see what's out there and find out what suits you. I have been to three different careers events and each time there have been different companies present, ranging from banks to retailers to schools and hospitals. Each company will tell you about their different graduate schemes and how best to apply for them, as well as the university offering tips and tricks on CV writing and interview preparation.

Our degree programmes

Mathematics, operational research and statistics

Mathematics, Operational Research and Statistics (BSc)
Duration: **3 years**
UCAS Code: **G991**

Mathematics, Operational Research and Statistics with Year Abroad (BSc)
Duration: **4 years**
UCAS Code: **GG23**

Mathematics, Operational Research and Statistics with Professional Placement (BSc)
Duration: **4 years**
UCAS code: **G990**

Mathematics, Operational Research and Statistics
Duration: **4 years**
UCAS code: **252D**

Mathematics, Operational Research and Statistics with Year Abroad (MMORS)
Duration: **5 years**
UCAS code: **252F**

Mathematics, Operational Research and Statistics with Professional Placement (G901)
Duration: **5 years**
UCAS code: **G901**

This course provides a solid foundation in the ideas and techniques of modern statistics and operational research.

Operational research, or management science, uses advanced statistical and analytical techniques to help organisations and individuals make decisions efficiently.

Working in this field, you might be:

- Determining manpower and resources
- Finding sequences in a supply and procurement chain
- Developing customer profiles and segments. This course will equip you with the skills, methods and ways of thinking you need to become a confident statistical analyst

You will be able to tackle complex organisational problems using methods such as data collection, statistical modelling and simulation. The BSc in mathematics, operational research and statistics also offers a good grounding in general mathematical theory and techniques.

In most cases, you will have the option to switch courses at the end of your first year, so you can keep your options open when you apply.

You will also have the opportunity to complete a professional placement year or a year abroad after your second year.

The four-year MMORS shares the same core as our BSc in mathematics, operational research and statistics but enables you to explore your areas of interest in greater depth, through optional modules, specialised year four modules and via a substantial research project.

This course provides the ideal preparation for high-level entry into relevant professions, and is also a solid base for pursuing a research career.

In year four, you will complete a major piece of project work, which could include:

- A survey of an existing area of mathematical theory not covered in taught modules
- An introductory research project
- The development of a piece of mathematical software

Not only will you explore a research topic of your choice, but you will also develop the professional skills that graduate employers are looking for.

You will also demonstrate that you are at the forefront of the discipline through extensive coverage of advanced topics in the school's main research areas.

The most up-to-date module information can be found on our website at: **www.cardiff.ac.uk/courses**

Hear from one of our students:

Osy Dallimore, mathematics, operational research and statistics (BSc) student

I instantly fell in love with the city

I went to Cardiff's open day and I'd never visited the city or knew too much about it, but I was so glad I went! I loved the city, and everyone I spoke to helping out on the day seemed really friendly. After that, I researched the university more and factors such as the maths faculty, student satisfaction and living costs made me sure that it would be the right choice.

Maths at university is much more abstract and thought provoking

Especially in first year, the problems we are given are unlikely to be solvable straight away – they require lots of thought and head scratching, making the final solution much more satisfying once you've got it. Also, for operational research or statistics, you can instantly see where in real life the content you're learning would be applicable.

I didn't know what operational research was before university

I originally enrolled on the standard mathematics course simply because I enjoyed maths. I then switched to mathematics, operational research and statistics at the beginning of second year because my first year helped me confirm that I'd quite like to go into statistics or data science. It's all about using mathematical methods to optimise systems, whether it's a project workflow or a queue. We use statistics, algorithms, and simulation to solve these problems. For example, what are the best routes for supplying a factory that maximises profit and minimises costs.

I would 100% recommend this course

If you like a challenge and want to keep your options open in terms of career-path, then 100% I would recommend it! There are so many jobs out there that simply ask for a quantitative subject, and maths is a great way of not completely specialising early while still having many options of what you could go into. It's not an easy subject, but it sure is rewarding!

Our degree programmes

Mathematics and music (joint honours)

Mathematics and Music (BA)
Duration: **3 years**
UCAS Code: **GW13**

Mathematics and Music with Year Abroad (BA)
Duration: **4 years**
UCAS Code: **GW31**

Discover abstract mathematical concepts, logical argument and deductive reasoning, while you build a portfolio of skills associated with literate musicianship.

This degree consists of 120 credits a year, split equally between the two schools.

You will develop a sound basis of knowledge, understanding and skills in the main areas of mathematics, alongside experience of a range of musical disciplines, including performance, composition, historical and critical musicology, ethnomusicology and acoustics.

The joint honours degree with a year abroad programme enables students to combine the study of music and mathematics with an adventure-packed third year studying at one of our partner universities abroad.

The most up-to-date module information can be found on our website at:
www.cardiff.ac.uk/courses

Hear from one of our students:

Augustus Tranter, mathematics and music (BA) student

I had a passion for music and maths

I chose this combination because I could not decide between pursuing a passion for music or diving into the world of mathematics. I have always been equally enthusiastic about both subjects, so this course allowed me to explore both of my interests.

This course was the perfect balance

What I loved most about my course was the perfect balance it struck between the two subjects. I was able to thrive in the music department, dedicating a lot of my time to ensembles and playing with the wonderful musical friends I made, all without neglecting my mathematical studies.

My most memorable experience was the ensemble module in my third year

It was fantastic to be able to collaborate with my friends to share an achievement. We had plenty of freedom, and our assigned tutor provided excellent support. The rehearsals leading up to the final performance were intense and unforgettable, and the actual performance was an absolute blast.

Both the music and mathematics department's facilities are excellent

The music department has an impressive array of pianos across the building, supporting me as an avid piano player. The Mac suite is not only a fantastic place to work but also an excellent social hub for meeting new people and strengthening relationships with peers. The Abacws building provides access to modern lecture rooms and study spaces.

I would recommend studying this combination to future students

Do not be afraid of spreading yourself too thin; it is a chance to discover what you truly enjoy. I am about to start a mathematics masters at Cardiff University, and I have been assured that spending half my undergraduate studying music will not put me at a disadvantage. The flexibility in module choices makes it easy to tailor your undergraduate experience and path to finding your interests.

Thinking ahead . . . what can you do with a degree in maths?

A maths degree can open doors to a wide range of professional fields

Employers appreciate the skills of logical thinking and the innovative problem-solving and decision making that can be taught in a maths degree, and understand that this can make for an intelligent, well-rounded graduate.

After graduation, you might choose to pursue a career teaching others theoretical mathematical knowledge. A maths qualification can also be a good starting point for a career in the finance sector, social research and scientific studies. There is also a clear pathway from the computer based skills learned in a maths degree to an IT or software development based career.

Maths students are particularly likely to be suited to the following job roles:

- Acoustic consultant
- Actuarial analyst
- Actuary
- Chartered accountant
- Data analyst
- Data scientist
- Investment analyst
- Researcher
- Secondary school teacher
- Software developer
- Statistician

Further study

Alternatively, you may choose to use your degree as a stepping stone to further study. Many graduates go on to complete a postgraduate teacher training course, or study for an MSc or PhD. Further study is essential for a research career and an undergraduate degree in mathematics is a great base for further study in a wide variety of STEM (Science, Technology, Engineering, and Mathematics) subjects.

Meet Megan North

Graduate in mathematics operational research and statistics (BSc)
Now working as an operational researcher in the Civil Service

Since leaving Cardiff University in 2021, I have enjoyed two years in the Civil Service

I work as an operational researcher as part of the Government Operational Research Service. I started in the Ministry of Justice, where I spent 12 months learning and developing my programming skills, as well as completing various analytical projects for my team, stakeholders and, occasionally, ministers. I then successfully achieved a promotion and moved to the Department of Health and Social Care.

There's a lot that I enjoy about my role

It's an ever changing and developing work area so there's never time to get bored! It's given me opportunities to develop my coding ability, both through more general analysis, visualisation, and modelling. Working in the Civil Service, it's also exciting to contribute to work that is valued by ministers in keeping them up to date with the latest situations within the health and social care systems and using data to provide evidence for decision-making.

The great thing about maths is that the career opportunities are varied and endless

I initially started my degree thinking I'd go down the accountancy route, however, I quickly realised I enjoyed statistics and operational research and suddenly I found a whole new path. Also, although many of my friends studied some of the same modules as I did, they're all in different careers – some went on to further study, some went to the 'Big 4', and a couple joined me in the Civil Service.

I had a brilliant time at Cardiff University – I'd recommend it

I loved the city, the proximity of the university to the centre and how integrated I felt as a student. Everything was easily accessible and there's always so much happening that you can get involved with!

In terms of choosing Cardiff University, I think the number of supportive lecturers is a great as, without their support, I wouldn't have walked away with the degree class that I did. Additionally, the opportunities were crucial in my decision and with placement years, studying abroad, talks from PhD students, presentations from prospective employers and more, I really feel that I was given more than I could have asked for.

Hear more from Megan about her top three experiences during her studies

Applications

To be considered for entry onto one of our undergraduate courses, please apply through UCAS.

Typical entry requirements

These typical requirements are for guidance. Please check our website for the latest information: **www.cardiff.ac.uk/ugcourses**

Most of our offers are conditional on A-level results.

The standard A-level offer for single honours mathematics degree programmes is **AAB/ABB** with an **A** in mathematics.

The standard A-level offer for our integrated masters schemes MMATH and MMORS is **AAA/AAB** with an **A** in mathematics.

A-levels in general studies and critical thinking are not counted towards these offers.

You are not required to have studied further mathematics, nor does it matter which version of mathematics A-level you have taken, as long as it contains the core material in pure mathematics.

A minimum C grade in GCSE English or equivalent is typically required.

The Welsh Baccalaureate is accepted as one of the three A level grades.

The corresponding IB offer is 36 points overall, with at least 6 in higher level mathematics.

An English qualification of minimum grade C at GCSE or equivalent is normally required.

Applications from mature students and students who have equivalent qualifications, such as BTEC, GNVQ, ACCESS, are also welcome.

Overseas students are also welcome, and we would consider your qualifications on a case by case basis.

How to find us

Key

🔴 School of Mathematics

🟥 University and NHS buildings

🟪 Student residences

Important legal information

The contents of this brochure relate to the entry 2024 admissions cycle and are correct at the time of going to press in October 2023. However, there is a lengthy period of time between printing this brochure and applications being made to, and processed by us, so please check our website at: **www.cardiff.ac.uk** before making an application in case there are any changes to the course you are interested in or to other facilities and services described here. Where there is a difference between the contents of this brochure and our website, the contents of the website take precedence and represent the basis on which we intend to deliver our services to you.

Your degree: Students admitted to Cardiff University study for a Cardiff University degree.

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Mae'r ddogfen hon hefyd ar gael yn Gymraeg. This document is also available in Welsh.

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This prospectus can be made available in alternative formats, including large print (text), Braille and on audio tape/CD.

To request an alternative format please contact Laura Roberts:

Tel: **029 2087 4455**
Email: **RobertsL9@cardiff.ac.uk**

CARDIFF UNIVERSITY

PRIFYSGOL CAERDYD

To find out more about the
School of Mathematics please visit
our website:
**www.cardiff.ac.uk/
mathematics**

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Student life

Got questions about student life?
Get them answered at:
**www.cardiff.ac.uk/
studentbloggers**

Want to know more about life at
Cardiff University? Our student
bloggers are recording their
experiences and are happy to
answer your questions.

Our student bloggers are real
students studying on a range of
courses. They are here to answer
any questions you have about life at
Cardiff University. What's a typical
day like? What clubs and societies
are there? Is Cardiff's music scene
any good? It can be almost anything.

Mae'r ddogfen hon hefyd ar gael yn Gymraeg.
This document is also available in Welsh.

MATHS/1023/250