

Cardiff School of Mathematics
Undergraduate Degree Programmes





Why Study Maths?

Maths is Important

Mathematics is a universal part of human culture. It is the tool and language of commerce, engineering and other sciences – physics, computing, biology etc. It helps us recognise patterns and to understand the world around us. Mathematics plays a vital, often unseen, role in many aspects of modern life, for example:

- Space travel
- Safeguarding credit card details on the internet
- Modelling the spread of epidemics
- Predicting stock market prices
- Business decision making

As society becomes more technically dependent, there will be an increasing requirement for people with a high level of mathematical training.

Maths is Diverse

Mathematics is extremely diverse and our degrees enable you to specialise in the areas that are of particular interest to you. Whether your interest is more in the area of pure maths, applied maths, or operational research and statistics, we have a choice of degree scheme for you.

Additionally you can tailor your own degree from the large number of individual modules we offer. These modules vary from the theoretical to the practical. So, on one hand for example, you can study abstract algebra and number theory and on the other, you can study internet security, financial mathematics and fluid flows. We also offer optional computing modules, providing practical skills that are much sought after in the job market.

Maths has Good Career Prospects

Analytical and quantitative skills are sought by a wide range of employers. A degree in mathematics provides you with a broad range of skills in problem solving, logical reasoning and flexible thinking. This leads to careers that are exciting, challenging and diverse in nature.

Whatever your career plans, or if you have no plans at present, a degree in mathematics provides you with particularly good job prospects (see page 25).

The generic nature of mathematics means that almost all industries require mathematicians. Mathematicians work in business, finance, industry, government offices, management, education and science. A proportion of our students will use their degree in mathematics as preparation for postgraduate studies at Masters or Doctorate level either continuing at Cardiff or elsewhere.

The experience gained through a sandwich course increases your employability even further (see pages 22 and 23). We offer the opportunity for a year's salaried work experience during your degree that enables you to try a job of your choosing and provides employers with evidence of your achievements and skills.

Maths is Exciting

Mathematics is an exciting and challenging subject which continues to develop at a rapid rate across many research areas. It has a natural elegance and beauty. Taking a real world problem and creating and applying mathematical models to aid understanding is often hugely satisfying and rewarding. If you enjoy maths at school, then you will probably enjoy maths at university even more.

“For me, the study of mathematics was the key that opened the doors of the universe.”

Robert Stewart,
NASA Space Shuttle Astronaut.

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Cardiff has a relaxed and friendly atmosphere



Welcome

Thank you for your interest in the Cardiff School of Mathematics. This brochure has been produced by our Admissions Tutors to give you accurate and up-to-date information about our undergraduate courses.

You will find that we have an exciting range of Honours Degrees to offer you, all of which have strong relevance to advancements in 21st century science and technology. Our courses range from traditional subject areas which provide you with core mathematical knowledge and techniques, to novel, currently developing subject areas which will qualify you for satisfying and worthwhile modern careers. In particular, we are one of only a few UK mathematics schools teaching Operational Research at undergraduate level.

There is a high demand for places studying maths at Cardiff. Students are attracted by our reputation for excellent teaching quality standards, the friendly atmosphere that pervades the School, and the care and support students receive from the staff. We strive to ensure that our students react enthusiastically to their courses and thoroughly enjoy their learning experience. We are proud of our students and their achievements.

Most students develop a strong attachment to Cardiff and some stay on in the School of Mathematics to study for a postgraduate degree. We are an internationally recognised centre of excellence for research in the mathematical sciences and are ranked 8th in the UK on the Research Power Index for Pure Mathematics in RAE 2008. This helps our undergraduate programmes too, since new research informs and dictates novel directions for undergraduate teaching. That is the way that mathematics develops.

I hope you decide to study at the Cardiff School of Mathematics and become part of a thriving mathematical community where you can enjoy excellent facilities, tuition of the highest quality, and a friendly supporting environment.



Professor Russell Davies
Head of School

Our courses will qualify you for satisfying and worthwhile modern careers.

Cardiff: the City

Cardiff is one of Europe's youngest capital cities. Compact, green, friendly and full of life, it provides a first-class environment in which to live and study.

As the capital city of Wales, Cardiff has an impressive range of leisure, sporting and cultural amenities. Many of the facilities are of international standard. The city boasts world-class concert venues in the International Arena and St David's Hall, and is the focus of national and international sports events at the Millennium Stadium.

Culturally, Cardiff is well catered for, with the National Museum and Gallery of Wales, several theatres covering a wide range of tastes and the historic Cardiff Castle. The city also boasts a vibrant shopping centre, numerous cinemas and restaurants, great pubs and music venues. The development of Cardiff Bay is a major attraction and is home to the Welsh Assembly and the impressive Wales Millennium Centre.

The Millennium Stadium



Cardiff: the University

Cardiff University is recognised in independent government assessments as one of Britain's leading teaching and research universities. Founded by Royal Charter in 1883, the University today combines impressive modern facilities and a dynamic approach to teaching and research with its proud heritage of service and achievement. The University's breadth of expertise encompasses: the humanities; the natural, physical, health, life and social sciences; engineering and technology.

The University has an outstanding location among the parks, Portland stone buildings and tree-lined avenues that form the city's elegant civic centre. Unusually for a civic university, most of the University's student residential accommodation is within easy walking distance of lecture theatres, libraries and the Students' Union, saving you time and money. More than £200 million has been invested in the university estate in recent years to provide new and refurbished facilities of the highest quality.

The University's Main Building





More online at:

www.cardiff.ac.uk

Cardiff is a member of the Russell Group of Britain's leading research universities. This creates a stimulating environment for teaching, ensuring that you are exposed to the very latest thinking and that the most modern technology and equipment is available. Teaching at Cardiff has been independently assessed as being of an excellent standard. The Quality Assurance Agency for Higher Education, which undertakes assessments with all UK universities, confirmed that prospective students, parents, teachers and graduate employers can have every confidence in the quality and standards of Cardiff's awards. Feedback in the recent National Student Surveys has also been very positive.

The student population is drawn from a variety of backgrounds, with students attracted from throughout Wales, the rest of the UK and world-wide. The University currently has around 25,000 undergraduate and postgraduate students and there is an almost equal balance between male and female students. International students comprise some 17% of the total student population. Government performance indicators show that students at Cardiff are more likely to succeed in their studies than students at most other UK universities. Currently, 95% of students successfully complete or transfer, better than many similar universities and better than the UK national average.



"The University has an excellent reputation for the quality of its teaching and research. Almost 60% of its research is ranked as world leading and it is a member of the Russell Group of leading research universities."

The Guardian University Guide

"Cardiff is a tip top uni academically... hugely popular with its students. Is Cardiff perhaps the best kept secret among Britain's universities?"

Virgin Alternative Guide to British Universities

"Cardiff has established itself as the front runner in Welsh higher education... it is a match for most rivals in teaching and research and the overall performance is amongst the best in Britain."

The Times Good University Guide



Students have access to the latest IT facilities



Cardiff has a relaxed and friendly atmosphere



More online at:

www.cardiff.ac.uk/residences

Accommodation

Cardiff has always attached great importance to the provision of student accommodation and has invested heavily in recent years to provide some of the highest quality residences in the UK university sector. Most of the accommodation is located close to the academic buildings. All first year undergraduates (who apply during the normal admissions cycle) are guaranteed a place in university accommodation. There is a choice of catered or self-catered residences.

New residences have been built in recent years and many of the older ones have been refurbished to a high standard. The majority of the 5,100 study/bedrooms have individual shower and toilet facilities and all halls of residence have computer network connection points.

Accepting an offer of a place at Cardiff University on a firm basis and completing your online Accommodation Request Form promptly increases the chances of your accommodation preferences being met. Full details of all University-owned accommodation are provided in the University Residences Guide.

Besides managing university property, the Residences Office maintains close links with the private sector and helps students looking to rent or share houses or flats.

“Guaranteed accommodation in halls and houses for first years. Very high quality and relatively cheap.”

Equitable Student Book

Talybont Court, the University's newest residence



A typical study bedroom



There is a range of catered and self-catered accommodation available



More online at:

www.cardiffstudents.com

Student Life

As a fast developing capital city, Cardiff is a great place to be a student. It's large enough to offer you an exciting variety of activities and entertainment, but small enough for you to feel comfortable in.

The Students' Union

Cardiff Students' Union is one of the biggest, best and most active in Britain. Solus, the Great Hall and the Taf are among the Union's major attractions. Solus is the students' own high quality nightclub and the second largest in South Wales. The Great Hall is a 1500-capacity venue for major concerts and the Taf Bar is the Union's very own 'local'.

Other facilities include CF10 café, a general shop and off licence, University bookshop, computer shop, a games room and video arcade, five full size snooker tables and twelve pool tables, satellite TV, banking and insurance services. The Union also has its own letting agency and Student Advice centre and is home to Xpress Radio (the student radio station), an award winning student newspaper, and more than 150 cultural, political, religious, social and sporting societies.

Jobshop

The Unistaff Jobshop is a student employment service that provides casual, clerical and catering jobs around the University to hundreds of students for up to 15 hours a week.

Solus nightclub, the Union's state-of-the-art nightclub



The University has three sports centres



The Union shop, part of the purpose-built Union complex

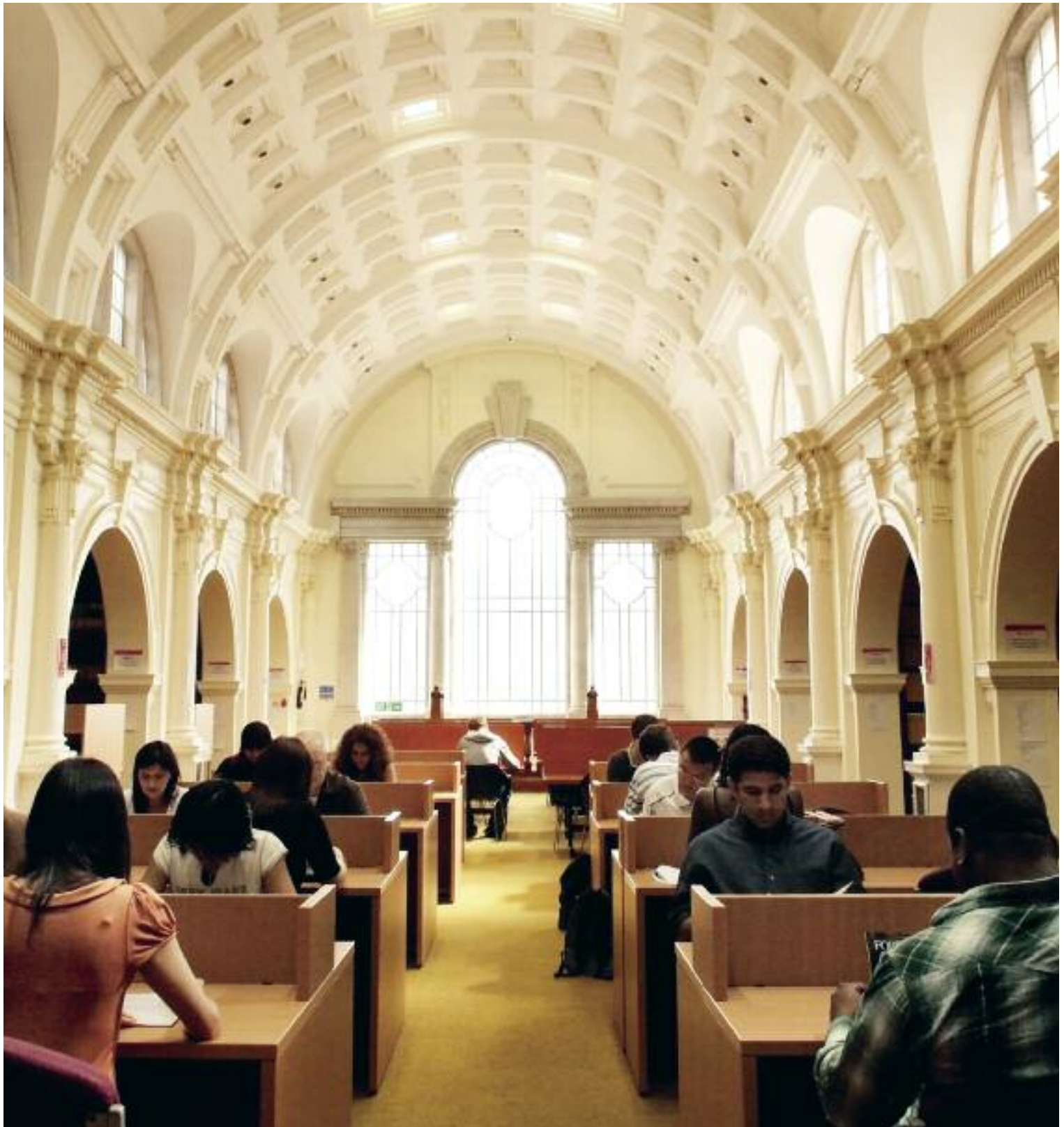
“Cardiff Students’ Union is the biggest and best equipped in Britain.”
The Independent

“Cardiff Students’ Union is independently recognised as the biggest and best in Britain.”
Equitable Student Book

“The Students’ Union provides an excellent range of facilities, clubs and societies.”
The Times Good University Guide

Degree Programmes Offered by the School of Mathematics

The University offers ample space for quiet study



The Cardiff School of Mathematics offers you 14 undergraduate degree programmes, which are listed in the following pages.

You will take 12 modules each year, usually six in each semester. Modules currently on offer in each programme are listed on later pages. There is a choice of modules in each year, especially in the final year.

The modules studied in the first year of the single honours courses (G100, G101, G111, G120, G990 and G991) are mostly common, so transfer between schemes is possible up to the start of the second year. It is also normally possible to transfer from joint honours to single honours programmes, although because some second and final year modules are dependent on first year ones there may be limitations on the module choices available.

The School is situated on the Cathays Park Campus (please see page...) in the civic centre of the City of Cardiff. The building houses lecture theatres, computer suites, a library and a cyber café. Access to the library and computer facilities is available throughout the day and early evening during term times.

Mathematics courses in Cardiff cover a wide range of topics. The schemes are designed to be stimulating and flexible, allowing you to make choices that suit your mathematical interests as you develop your mathematical skills. A mathematics degree in Cardiff provides a good foundation for further study after graduation or for a career in many industries. The problem solving and logical reasoning skills that are learned in these degrees are sought after by many employers.



Access to library and computing facilities is available throughout the day and until 9pm during term time



Degree Programmes Overview

BSc Mathematics (UCAS Code: G100)

This three-year single honours course allows you to choose from a wide range of mathematical topics, with a core of pure mathematics. Additional optional modules in pure mathematics, applied mathematics, operational research, statistics and computing allow you to acquire a good general knowledge of mathematics.

MMath Mathematics(UCAS Code: G101)

This four-year single honours course allows you to delve more deeply into the areas of pure and applied mathematics. There is also the opportunity to undertake your own substantial research in the fourth year in a subject area of your choice supervised by a member of staff.

BSc Mathematics and its Applications (UCAS Code: G120)

This is a three-year single honours course for students who wish to study those topics in mathematics that are applied to solve problems in science, business and commerce. There is a core of essential mathematics in Years One and Two.

BSc Mathematics and its Applications (UCAS Code: G111)

This is a four-year 'sandwich' course in which the third year is spent in a salaried post away from the University undertaking professional training. The academic part is identical to G120.

BSc Mathematics, Operational Research and Statistics (UCAS Code: G991)

This is a three-year single honours course for students who have a strong interest in operational research and statistics, subjects that are applied to the solution of problems in, for example, medical and pharmaceutical research, planning and management.

BSc Mathematics, Operational Research and Statistics (UCAS Code: G990)

This is a four-year 'sandwich' course in which the third year is spent in a salaried post away from the university undertaking professional training. The academic part is identical to G991.

BSc Mathematics and Physics (UCAS Code: FG31)

This is a three-year joint honours course that enables you to combine a study of pure and applied mathematics with theoretical and experimental physics. Equal time is spent on each subject.

A project may replace one or two modules in the final year, providing a valuable opportunity to apply the knowledge and skills you have acquired and to develop communication and presentation skills



BSc Computing and Mathematics (UCAS Code: GG14)

This is a three-year joint honours course that enables you to combine a study of pure mathematics and numerical analysis or statistics with computer science and information systems.

BA French and Mathematics (UCAS Code: GR11)

This is a four-year joint honours course in which you spend the third year abroad. A study of French language and culture is combined with mathematics, where there is a choice of modules available, especially in the final year. There is an opportunity to study a third subject or more mathematics in Year One.

BA German and Mathematics (UCAS Code: GR12)

This is a four-year joint honours course in which you spend the third year abroad. A study of German language and culture is combined with mathematics, where there is a choice of modules available, especially in the final year. There is an opportunity to study a third subject or more mathematics in Year One.

BA Mathematics and Philosophy (UCAS Code: GV15)

This is a three-year joint honours course. Equal time is spent on the two subjects in the second and final years, but in the first year, there is an opportunity to study more mathematics or a third subject. Both in mathematics and philosophy there is a choice of modules, especially in the final year.

BA Mathematics and Music (UCAS Code: GW13)

This is a three-year joint honours course in which equal time is spent on the two subjects throughout the course. A study of musical theory and performance is combined with pure mathematics and either further pure mathematics, applied mathematics or statistics.

BA Mathematics and Religious Studies (UCAS Code: VG61)

This is a three-year joint honours course. You combine a study of pure mathematics and either further pure mathematics, applied mathematics or statistics with religious and theological studies. Equal time is spent on the two subjects in the second and final years. There is an opportunity to study a third subject or more mathematics in Year One.

BA Mathematics and Welsh (UCAS Code: QG51)

This is a three-year joint honours course in which equal time is spent on the two subjects throughout the course. A study of Welsh language and literature is combined with pure mathematics and either additional pure mathematics or statistics.

Please note, this course is only available to people whose first language is Welsh. Further information on all the courses listed above is given on the following pages.

Cardiff offers a range of joint honours degree programme which can be studied with mathematics



Mathematics BSc

UCAS Code G100

Mathematics BSc is our most general degree programme and provides you with a firm foundation in all the main areas of mathematics, providing skills much in demand for a wide range of careers. It is a very flexible degree programme so you can specialise in the areas of mathematics that are of particular interest – pure mathematics, applied mathematics, operational research, statistics and computing. There is an essential core of pure mathematics in the first two years of study but you can start to tailor your degree to your interests even in Year One.

You will study 12 modules each year. In the first year, you can choose to study only mathematics modules or you may choose up to four modules from other disciplines, for example computing, physics, music or a language. In Year Two, six core modules are studied, together with six modules chosen from a list of options. One module may be taken from other disciplines. In the final year, there are no core modules. Instead you choose the 12 modules that are of most interest to you from a wide and diverse choice of options.

Lectures and tutorials are informed by the latest research



Modules Currently on Offer

Year One

You will study:

- Calculus Methods I and II
- Algebra I and II
- Analysis I and II
- Modelling
- Introduction to Probability
- Computing Skills (this and one other optional module can be replaced by Introduction to Computational Thinking and Java Programming)
- Number Theory I

And two modules chosen from the following:

- Mechanics I
- Statistical Inference I
- Numerical Analysis I

Note, that students can replace up to 40 credits in Maths with credits from other subjects.

Year Two

Specialisation continues in the second year.

You will study:

- Calculus of Several Variables
- Matrix Algebra
- Complex Analysis
- Series and Transforms
- Analysis III
- Linear Algebra

And six modules (or equivalent) selected from the following list:

- Number Theory II
- Modelling with Differential Equations
- Numerical Analysis II
- Mechanics II
- Fluid Dynamics
- Vector Calculus
- Ordinary Differential Equations
- Operational Research (Double Module)
- Visual Basic Programming for Operational Research
- Foundations of Statistics (Double Module)
- Computational Statistics
- Accountancy
- Algorithms and Data Structures (Double Module)
- Object Oriented Methods

Year Three

Specialisation is developed further and a project can be taken, which may involve practical application of theoretical knowledge. You will study twelve modules (or equivalent), chosen from the following:

- Calculus of Variations
- Coding Theory
- Combinatorics
- Complex Function Theory
- Fourier Series and Integrals
- Linear Spaces and Operators
- Groups, Rings and Fields
- Integral Equations
- Wavelets and Data Compression
- Differential Geometry
- Fluid Dynamics
- Numerical Solution of Elliptic Differential Equations
- Applied Nonlinear Systems
- Vibrations and Waves
- Discrete Optimisation
- Elements of Financial Mathematics
- Experimental Design
- Further Topics in Probability
- Mathematical Programming
- Medical Statistics
- Queueing Theory and Stock Control
- Regression Analysis
- Time Series Analysis and Forecasting
- Stochastic Models for Insurance
- Survey Sampling
- Mathematical Foundations of Internet Security
- Parallel Processing
- Project (Single Module)
- Project (Double Module)

Ben

Ben graduated from Cardiff in 2010 with a first class honours degree in Mathematics and its Applications. During his degree he spent an industrial training year at the Higher Education Funding Council for Wales. He is now working for Smartodds, a company providing statistical research and football modelling services in the betting sector.



Mathematics MMath

UCAS Code G101

The four year MMath degree programme is offered to satisfy the need for a more advanced level of mathematical training than is available in a 3-year programme. It gives the opportunity to delve more deeply into the areas of Pure and Applied Mathematics. The modules offered in the first three years of the programme are common to the 3-year degree programmes in mathematics, allowing the flexibility of transfer between courses. In the first year you study a variety of mathematics modules. In the second and third years you take a selection of advanced modules that allow you to build on the interests developed in the first year.

In the fourth year the course develops research training and enhanced mathematical skills, especially in Mathematical Analysis, Mathematical Physics and Fluid Dynamics. There is also a major piece of project work in which you would be undertaking novel research. The course is an ideal preparation for students wishing to go on to research work in mathematics, work for a technological company or who simply want to gain a deeper understanding of mathematics and is highly regarded by prospective employers.



Picture?

Modules Currently on Offer

Year One

You will study:

- Calculus Methods I and II
- Algebra I and II
- Analysis I and II
- Modelling
- Introduction to Probability
- Computing Skills (can be replaced by Introduction to Computational Thinking)
- Number Theory I
- Numerical Analysis I

And one module chosen from the following:

- Mechanics I
- Statistical Inference I

Year Two

Specialisation continues in the second year.

You will study:

- Calculus of Several Variables
- Matrix Algebra
- Complex Analysis
- Series and Transforms
- Analysis III
- Linear Algebra
- Numerical Analysis II
- Vector Calculus

And four modules (or equivalent) selected from the following list:

- Number Theory II
- Modelling with Differential Equations
- Mechanics II
- Fluid Dynamics
- Ordinary Differential Equations
- Operational Research (Double Module)
- Foundations of Statistics (Double Module)

Year Three

You will study:

- Calculus of Variations
- Coding Theory
- Combinatorics
- Linear Spaces and Operators
- Differential Geometry

And seven modules chosen from:

- Complex Function Theory
- Fourier Series and Integrals
- Groups, Rings and Fields
- Integral Equations
- Wavelets and Data Compression
- Fluid Dynamics
- Numerical Solution of Elliptic Differential Equations
- Applied Nonlinear Systems
- Vibrations and Waves
- Discrete Optimisation
- Experimental Design
- Further Topics in Probability
- Mathematical Programming

Year Four

You will study:

- MMath Project (40 credits)

And four modules chosen from:

- Operator Algebras and Non-Commutative Geometry
- Lie Algebra
- From Fermat to Feynman – Variational Principles in Physics
- Measure Theory
- Computational Fluid Dynamics
- Mathematical Principles of Image Processing
- Functional Analysis

Mathematics and its Applications BSc

UCAS Code G120 Three-year course

UCAS Code G111 Four-year 'sandwich' course

Mathematics is the language of science, technology and engineering, and its various branches are used throughout commerce and the business world. The Mathematics and its Applications degree programme aims to provide you with the skills and tools that are used extensively in these fields.

This course is available as either a three-year course or as a four-year 'sandwich' course, in which the third year is spent undertaking professional training away from the University. Full details and some case studies can be found on pages 22 and 23. This gives you the opportunity of seeing and being involved in work in which mathematics or one of its applications plays a major role. The academic parts of the three and four-year schemes are identical.

You study calculus, algebra and analysis in the first year, together with the applications branches of modelling, mechanics, statistics and computation. In the second year there are six core modules, four in essential core mathematics and two in applied mathematics. The remainder of the curriculum is optional and can either be in the applied mathematical side of the subject or the statistical field, including operational research, an important topic much used in business and commerce. In the final year you can choose from a wide range of applicable topics in applied mathematics, operational research, statistics, computational mathematics or mathematical physics.

A project may replace one or two modules in the final year, providing the opportunity to develop communication and presentational skills and to learn how to apply your mathematical skills to an investigation of your choice.

A typical small group tutorial



Modules Currently on Offer

Year One

You will study:

- Calculus Methods I and II
- Algebra I and II
- Analysis I and II
- Modelling
- Introduction to Probability
- Numerical Analysis I

And either:

- Computing Skills
- Mechanics I
- Statistical Inference I

Or:

- Introduction to Computational Thinking
- Java Programming

And either:

- Mechanics I

Or:

- Statistical Inference I

Year Two

Specialisation starts in the second year.

You will study:

- Calculus of Several Variables
- Complex Analysis
- Matrix Algebra
- Series and Transforms
- Modelling with Differential Equations
- Vector Calculus

And the equivalent of six more modules selected from the following:

- Elementary Fluid Dynamics
- Mechanics II
- Ordinary Differential Equations
- Numerical Analysis II
- Operational Research (Double Module)
- Visual Basic Programming for Operational Research
- Foundations of Statistics (Double Module)
- Computational Statistics
- Analysis III
- Linear Algebra
- Algorithms and Data Structures (Double Module)
- Object Oriented Methods

Year Three

Specialisation is developed further. You will study twelve modules (or equivalent), chosen from the following:

- Calculus of Variations
- Coding Theory
- Combinatorics
- Complex Function Theory
- Fourier Series and Integrals
- Linear Spaces and Operators
- Groups, Rings and Fields
- Integral Equations
- Wavelets and Data Compression
- Differential Geometry
- Fluid Dynamics
- Numerical Solution of Elliptic Differential Equations
- Applied Nonlinear Systems
- Vibrations and Waves
- Discrete Optimisation
- Elements of Financial Mathematics
- Experimental Design
- Further Topics in Probability
- Mathematical Programming
- Medical Statistics
- Queueing Theory and Stock Control
- Regression Analysis
- Time Series Analysis and Forecasting
- Stochastic Models for Insurance
- Survey Sampling
- Mathematical Foundations of Internet Security
- Parallel Processing
- Project (Single Module)
- Project (Double Module)

Ketan

Ketan graduated from Cardiff University with a first class honours degree in Mathematics and its Applications. He started work for the Ministry of Defence as an Operational Research Analyst primarily working for front line support. Having spent a year with the MOD he decided that he wanted to experience a more business-oriented role and accepted a job as an analyst with Royal Bank of Scotland Insurance.



Mathematics, Operational Research and Statistics BSc

UCAS Code G991 Three-year course

UCAS Code G990 Four-year 'sandwich' course

The Mathematics, Operational Research and Statistics BSc degree course is a programme that enables you to combine the study of mathematical topics with the more practical ones of operational research and statistics. In the final year of the course it is possible to specialise in operational research and statistics, but in the first two years there is also a core of pure mathematics in the curriculum.

The four-year 'sandwich' course is identical to the three-year course but a year is spent between the second and final years in a period of professional training. More information on the establishments who collaborate with us in this scheme can be found on page 22. Operational Research and Statistics are both topics that are widely used outside of universities and there are many career opportunities in these areas.

There are 12 modules in each year of study. In the first year these modules are in pure mathematics, statistics and computation, with the option of taking a module in applied mathematics. Alternatively a module can be chosen from another School, for example a language, music or education. In Year Two there are eight core modules in pure mathematics, operational research and statistics, with the other four being chosen from topics in pure or applied mathematics, accountancy or computation. Alternatively, one module can be selected from those available in another School. There are no core modules in the final year, but at least six have to be in operational research and statistics. This flexibility enables you to combine a study of statistics and operational research with pure or applied mathematics modules up to a final year level.

A project may replace one or two modules in the final year, providing the opportunity to develop communication and presentational skills and to learn how you can apply operational research or statistical techniques to an investigation of your choice.

Cardiff School of Mathematics is modern and well equipped



Modules Currently on Offer

Year One

You will study:

- Calculus Methods I and II
- Algebra I and II
- Analysis I and II
- Modelling
- Introduction to Probability
- Statistical Inference I
- Computing Skills
- Numerical Analysis I

And either:

- Mechanics I

Or:

- Number Theory I

Year Two

Specialisation starts in the second year.

You will study:

- Calculus of Several Variables
- Complex Analysis
- Matrix Algebra
- Series and Transforms
- Foundations of Statistics (Double Module)
- Operational Research (Double Module)

And four more modules selected from the following:

- Accountancy
- Linear Algebra
- Modelling with Differential Equations
- Numerical Analysis II
- Visual Basic Programming for Operational Research
- Computational Statistics

Krupa

Krupa studied for the BSc Mathematics, Operational Research and Statistics degree course and spent her placement year working with GlaxoSmithKline, a large pharmaceutical company, based at their site in Greenford, Middlesex.

After graduation Krupa decided that she would embark on a career in the financial industry. She is now working as a trainee accountant for a large firm of chartered accountants who are sponsoring her while she studies for her professional qualifications.



Year Three

Specialisation is developed further. At least six modules have to be taken in statistics and operational research (from the first eleven listed).

- Discrete Optimisation
- Elements of Financial Mathematics
- Experimental Design
- Further Topics in Probability
- Mathematical Programming
- Medical Statistics
- Queueing Theory and Stock Control
- Regression Analysis
- Stochastic Models for Insurance
- Survey Sampling
- Time Series Analysis and Forecasting
- Applied Nonlinear Systems
- Calculus of Variations
- Coding Theory
- Complex Function Theory
- Combinatorics
- Differential Geometry
- Groups, Rings and Fields
- Integral Equations
- Numerical Solution of Elliptic Differential Equations
- Wavelets and Data Compression
- Mathematical Foundations of Internet Security
- Project (Single Module)
- Project (Double Module)



There is a good staff-student relationship within the School

Joint Honours

Many employers look favourably on students who can demonstrate their abilities in more than one subject area. We offer a wide range of Joint Honours degree programmes, each of which opens up interesting possibilities for choice of career.

BA Joint Honours Mathematics and a Humanities Subject

Mathematics is combined with one of a range of other disciplines from the Humanities for the award of a BA degree. These are: French, German, Music, Philosophy, Religious Studies and Welsh. If French or German is your second subject, the course is of four years duration, with the third year spent abroad in an appropriate country.

Twelve modules or their equivalent (120 credits) are taken each year. In the second and final years 60 credits are taken in each subject. In the first year of the Joint Honours degrees with Music and Welsh, 60 credits are studied from each subject. For the remainder of the schemes 60 credits must be studied in mathematics and at least 40 credits in the other subject. The additional 20 credits can be gained from either modules from your second subject, a third subject or extra mathematical modules, increasing the choice of modules in later years.

The mathematics component of the courses has been designed to give you maximum flexibility, while ensuring that you have a good background knowledge of essential mathematical ideas. In the first two years there is a core of 40 credits of compulsory pure mathematics. The remaining 20 credits in mathematics are chosen to reflect your interests, either in additional pure mathematics, applied mathematics or statistics. A range of final year modules that follow on from your choices in Years One and Two is open to you, although timetabling constraints may mean that you will not necessarily have a completely free choice of modules.

Further details can be found in the prospectus and by contacting the Admissions Tutor for the relevant subject. Alternatively see our website at: www.cardiff.ac.uk/maths

UCAS Codes for BA Joint Honours Mathematics and a Humanities Subject.

- Mathematics and French** (UCAS Code: GR11)
- Mathematics and German** (UCAS Code: GR12)
- Mathematics and Music** (UCAS Code: GW13)
- Mathematics and Philosophy** (UCAS Code: GV15)
- Mathematics and Religious Studies** (UCAS Code: VG61)
- Mathematics and Welsh** (UCAS Code: QG51)

Year One

You will study:

- Calculus Methods I and II
- Algebra I and II

And at least two modules from:

- Analysis I & II
- Modelling
- Mechanics I
- Introduction to Probability
- Statistical Inference I

Plus other modules depending on your second subject, to make up twelve (or equivalent) in all.

Year Two

You will study:

- Calculus of Several Variables
- Complex Analysis
- Matrix Algebra
- Series and Transforms

And at least two modules from:

- Analysis III
- Linear Algebra
- Modelling with Differential Equations
- Vector Calculus
- Foundations of Statistics (Double Module)

Plus other modules in your second subject.

Year Three

Six modules are chosen from:

- Calculus of Variations
- Complex Function Theory
- Coding Theory
- Combinatorics
- Fourier Series and Integrals
- Integral Equations
- Linear Spaces and Operators
- Applied Nonlinear Systems
- Differential Geometry
- Numerical Solution of Elliptical Differential Equations
- Mathematical Foundations of Internet Security
- Wavelets and Data Compression
- Experimental Design
- Regression Analysis
- Medical Statistics
- Survey Sampling

Plus other modules in your second subject.

BSc Joint Honours Mathematics and Physics (UCAS Code: FG31)

The BSc in Mathematics and Physics is a joint degree with equal contributions from the two subjects. In the first year you are introduced to essential applied and pure mathematical concepts. There is some choice in Year Two, allowing a selection to be made from a range of options in applied mathematics and mathematical physics in the final year.

Year One

The core modules in mathematics are:

- Calculus Methods I and II
- Algebra I and II
- Modelling
- Mechanics I

Plus six modules in physics.

Year Two

You will study the following core modules:

- Calculus of Several Variables
- Matrix Algebra
- Modelling with Differential Equations
- Series and Transforms
- Vector Calculus

And one of:

- Elementary Fluid Dynamics
- Complex Analysis

You will also study six modules in physics.

Year Three

Six modules in mathematics are chosen from the following:

- Calculus of Variations
- Combinatorics
- Integral equations
- Numerical Solution of Elliptic Differential Equations
- Differential Geometry
- Applied Nonlinear Systems
- Fluid Dynamics
- Vibrations and Waves

You will also study the equivalent of six modules in physics.

Physics Admissions Tutor: Dr Carole Tucker

Telephone: +44(0)29 2087 4144

Email: Carole.Tucker@astro.cardiff.ac.uk

Computing Admissions Tutor: Mrs Elaine Slater

Telephone: +44(0)29 2087 4598

Email: Elaine.A.Slater@cs.cardiff.ac.uk

BSc Joint Honours Mathematics and Computing (UCAS Code: GG14)

The BSc in Mathematics and Computing is a joint degree with equal contributions from the two subjects. In the first two years there is a core of four compulsory modules in pure mathematics, with choice for the other two. You can choose these modules to reflect your interests, either additional pure mathematics, numerical mathematics or statistics. There is a wide choice of modules in the final year, though timetable restrictions may limit your choice.

Year One

In mathematics the four core modules are:

- Calculus Methods I and II
- Algebra I and II

And you choose two modules from:

- Analysis I and II
- Modelling
- Numerical Analysis I
- Introduction to Probability
- Statistical Inference I

Plus six modules in computing.

Year Two

In mathematics the four core modules are:

- Calculus of Several Variables
- Complex Analysis
- Matrix Algebra
- Series and Transforms

Plus the equivalent of two modules chosen from:

- Numerical Analysis II
- Analysis III
- Linear Algebra
- Foundations of Statistics (Double Module)

Plus six modules in computing.

Year Three

In mathematics six modules are chosen from:

- Complex Function Theory
- Coding Theory
- Combinatorics
- Integral Equations
- Numerical Solution of Elliptic Differential Equations
- Mathematical Foundations of Internet Security
- Wavelets and Data Compression
- Experimental Design
- Regression
- Analysis

You will also study six modules in computer science.

Professional Training

On the BSc Mathematics and its Applications and the BSc Mathematics Operational Research and Statistics courses there is the opportunity for some students to spend a year working as a salaried employee between the second and final years. If you chose this option you would work in a post related to mathematics or statistics in an establishment approved by the School.

Our training officer will help you find a suitable placement from amongst those available at the time, and your preferences in type of work and location will be taken into account. Although you will be an employee during this year, you will also still be classified as a student and eligible for any student benefits. You will be visited by your University personal tutor and your progress at work will be monitored and discussed with your training supervisor. At the end of the year you complete a report on your training and you will be eligible to apply for a City and Guilds Senior Award at the licentiateship (LCGI) level.

The professional training scheme has proved to be popular, and has been running successfully for many years. It gives some of our undergraduate students the opportunity of experiencing mathematical, statistical and computing work that is done outside of the University environment. We have links with a wide range of establishments who take part in the scheme. Because of the experience of these employers in taking on undergraduate trainees, they are aware of the standard of expertise that they can expect. The links have been developed so that both the student and the employer benefit from the experience.

For many of our students a professional training year has been the first step on the career ladder, and after graduation the first permanent job is sometimes with the establishment where the training year was spent. Even for those students who seek a career elsewhere after graduating, the training year is attractive to future employers, who hold the period of work experience in high regard.

If you are interested in the professional training year but are uncertain at the moment whether you want to commit yourself, this would not stand in the way if you change your mind later. It is possible to transfer between the three and four-year courses at any time up to enrolment at the beginning of the second year.

We have a wide range of contacts, and in recent years have helped around 30 students each year to find a professional training post. Among the branches of government who have employed our students are HM Revenue and Customs (London), Ministry of Defence (Warminster and Shrivenham), Office for National Statistics (Newport) and Welsh Assembly Government (Cardiff). The business and finance sector has also participated, including Barclaycard (Northampton), Lloyds Banking Group (Cardiff, Bristol and London) and PricewaterhouseCoopers (various locations). In the industrial sector we have placed many students with companies such as BAe Systems (Bristol), Corus (Newport), GSK (Greenford and Harlow), National Air Traffic Services Ltd (near Southampton), Roche Pharmaceuticals (Welwyn Garden City), Rolls Royce (Derby) and Rutherford Appleton Research Laboratories (near Didcot).



Students' Experiences

Dewi

Dewi studied for the BSc Mathematics, Operational Research and Statistics degree. As part of his degree, he completed an Industrial Placement year at the Ministry of Defence (MoD) working as an analyst in the Development, Concepts and Doctrine Centre (DCDC), based in Shrivenham.



His work focussed on the futuristic world of 2040 and his responsibilities included running war games, experiments and workshops with senior military officers, analysing conceptual papers on futuristic technology and graphically representing their themes. Dewi says "It is this experience that sets me apart from other graduates as it has given me invaluable insights to not only how businesses and offices are run, but also how our country is run. The experience helped develop me professionally and academically. Whilst the work was primarily managerial, many analytical aspects applied to my studies and supported by my experiences I went on to achieve a first class degree."

Dewi particularly excelled in financial-based subjects due to his interest in the area. Consequently he was offered a position at Tesco on their 'Finance Graduate Scheme'. Having accepted the offer Dewi will soon be relocating to Hertfordshire. Dewi says "With my successful work placement, strong degree and good career prospects I look forward to a successful and exciting future"

Melanie

Melanie chose to study for a BSc Mathematics and its Applications degree, and was attracted to the possibility of a placement year. She spent her professional training year in London as an Analyst with PA Consulting, an international management, systems and technology consultancy. She was a member of the Decision Sciences practice, learning how their experience in operational research, modelling and simulation helps clients of all industry sectors to make informed decisions on business issues.



Her work was mainly project based, and she built on her knowledge of operational research, Visual Basic programming and the Excel spreadsheet to build computer models and tools to suit the needs of the clients. She also learned

business skills, including the ability to identify the steps needed to study a specific project and to understand the processes of the working world. She learned how to be self motivated and to manage her time effectively, and she developed her communication skills in meetings with senior colleagues and clients. After graduating with First Class Honours, Melanie has obtained a permanent position with PA Consulting.

A Week in the Life of a Mathematics Student at Cardiff

So what does a Maths student actually do during a “normal” week at Cardiff University?

Semesters

The year is divided into two semesters, the first running from early October to January and the second from February until June. Each semester, you will normally study 6 modules.

In a teaching week, you will normally do the following:

Lectures and Tutorials

In a typical week, you will attend 12 hours of lectures, where new material is presented to you. There are an additional 3 hours of examples classes, where understanding is re-inforced by working through example questions. In the first year you will also attend 3 small group tutorials where you have the chance to work in small groups and ask individual questions. There is always a chance to grab a coffee between lectures in the School Cybercafe.

Assessment

In a normal week you will hand in three pieces of coursework. These normally involve completing worked examples based on the material you have been taught.

Some modules are only assessed by coursework, for example some computing modules. Examinations take place at the end of each semester.

The Maths Support Service

If you are finding any of the Mathematics difficult to understand, you can get help from The Maths Support Service. The service is available for ten hours every week and offers help in a relaxed and informal atmosphere. Many of our students have found this resource hugely beneficial to their studies and you should never feel alone if you are struggling to understand anything – there is always help available.

Sports and Social Life

University provides a great opportunity to excel both academically and socially. There is much going on every evening both in the Students Union and in the city centre which is close to the Maths department. There are facilities for a huge range of sporting activities and also plenty of part time work opportunities. Lectures always finish at lunch time on a Wednesday giving students the chance to do some sports, participate in charity work or even go back to bed!!



Cardiff School of Mathematics Statistics

Some Results from the 2010 National Students Survey

88% replied “Overall, I am satisfied with the quality of the course”.

89% think “the course is intellectually stimulating”.

83% think “assessment arrangements and marking have been fair” with **80%** stating “feedback on my work has been prompt”.

89% “have been able to contact staff when I needed to” with **80%** saying “good advice was available when I needed to make study choices”.

87% think “the course is well organised and runs smoothly”.

98% “have been able to access general IT resources when needed” and **92%** say “library resources and services are good enough for my needs”

What our Mathematics Students have said about us

What reasons originally influenced your decision to come to study in Cardiff?

“Cardiff is a well-respected university and its Mathematics department has a good reputation compared with other universities in its league. I also wanted to stay in Wales, which made my choice fairly easy!”

“First impressions of the department on Open Day.”

“The Open Day was really nice, and everyone was so friendly at the School of Maths.”

“The city, Cardiff’s reputation, and the friendly staff and warm environment I witnessed on visiting the Maths department.”

“I loved the city and when I came to visit the staff were open and friendly and I really liked the atmosphere.”

“It was recognised as one of the best universities for Mathematics in the UK”

“The general feel of the Cardiff and the University was really friendly. Not too big, not too small”

“The reputation of the university and the city were major factors. The variety within the course was appealing. The opportunity of a year in industry also had a positive influence”

“It is a good university with a good student life and it is not an expensive city”

Would you recommend Cardiff to others as a place to come to study? Why?

“Yes, as I believe the lecturers are very good and the Student Union is one of the best in the country.”

“Yes. Careers help was useful and I was impressed with the support given in the final year, with employers coming to give talks on graduate jobs.”

“I would definitely recommend Cardiff to others. It has been a great three years. The course has been enjoyable and the lecturers inspirational.”

“Yes, I’ve had a great experience. The university is held with high regard being a member of the Russell Group which is useful when applying for jobs”

“Yes the course has good variety and a flexible choice of modules. The year in industry was valuable”

“Yes, the past 3 years have been exciting and have changed me for the better and given me a boost in confidence”

“Yes, there are very helpful staff and I learnt a great deal on the course, the city is very good as well”

“Definitely as it is an amazing city and a top university”

“Yes, the support available was outstanding and the atmosphere within the department is always friendly and welcoming. Most of the modules were interesting and useful”

“Yes, highly recommended due to excellent course content and support provided by staff”

“Yes, course was interesting and offered Operational Research which is applicable and good fun”

“Yes, the Maths department has a fantastic atmosphere. The course is interesting and well taught and the city of Cardiff is a fantastic place to live”



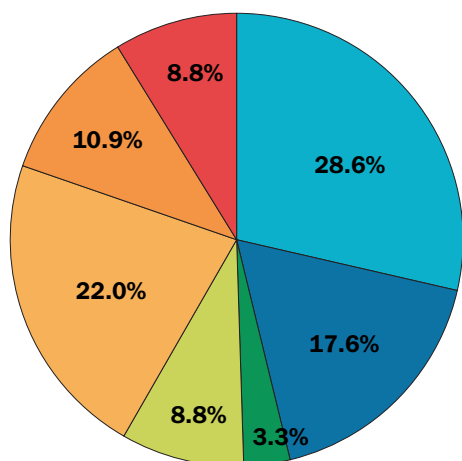
More online at:

www.cardiff.ac.uk

www.cardiff.ac.uk/carsv/

Careers

A study of mathematics gives you an insight into problem solving and logical thought, the organisation of ideas and argument and an appreciation of structure. Mathematicians also possess computation skills, and in Cardiff we incorporate practical computing in several of our modules. All these skills are valued by employers in a wide range of organisations, so our students are equipped to embark on a stimulating and rewarding career after graduation. The pie chart below shows the destinations of Cardiff graduates in single honours Mathematics degrees in 2008.



- Professions/Commerce
- Public Service
- Industry
- Employment with Further Study
- Further Study
- Other
- Unemployed



This is a selection of first time employers of recent Cardiff mathematics graduates:

- | | |
|-----------------------------|--------------------------------|
| Professions/Commerce | EMI |
| Barclays Bank | GlaxoSmithKline |
| Deloitte | Mowlem Group |
| First Actuarial | PA Consulting |
| Clerical Medical | Roche Pharmaceuticals |
| FIRSTPLUS | Public Service |
| HBOS | HM Revenue and Customs |
| Legal and General | DEFRA |
| Nationwide Building Society | Ministry of Defence |
| Price Waterhouse Coopers | Monmouthshire County Council |
| Industry | National Air Traffic Services |
| BAE Systems | National Assembly for Wales |
| British Energy | National Health Service |
| Corus Europe | Office for National Statistics |
| General Dynamics UK | |

Research

The research work undertaken by academic staff is an essential component of the life of the School, and Cardiff has been highly rated in recent national assessments. Current interests encompass a very wide range, from highly theoretical investigations in various branches of Pure Mathematics to practical problem solving in the fields of Applied Mathematics, Operational Research and Statistics.

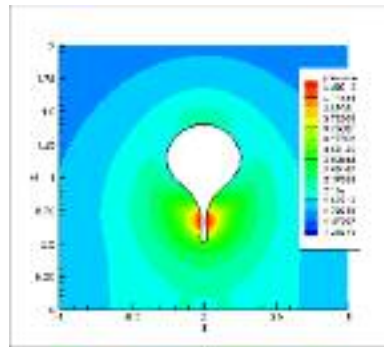
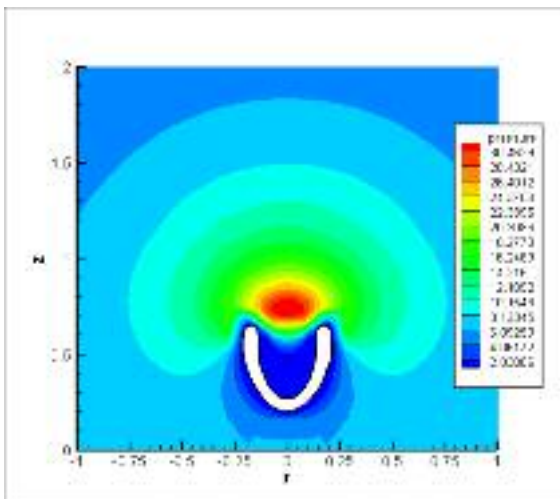
Pure Mathematics

There are three main areas of research in Pure Mathematics: Analysis and Differential Equations, Number Theory and Operator Algebras. Many aspects of these subjects are studied, from the most abstract and theoretical to problems arising in mathematical physics. Topics include function spaces, inverse spectral problems (can one hear the shape of a drum?), sieve methods and their applications, algebraic methods in statistical mechanics and conformal field theory.

Applied Mathematics

The research interests of the Applied Mathematics group include theoretical and computational fluid mechanics, rheology, numerical analysis, inverse problems, applied analysis and the electrical behaviour of gases. Interdisciplinary research is performed in a diverse range of application areas including Earth mantle dynamics, fuel injection in diesel engines, materials characterization, composite materials, lubrication of bearings, aerodynamics, groundwater flow and the extrusion of polymeric materials. The group is interested in the modelling, analysis and numerical simulation of these problems.

Computer predictions of a bubble as it undergoes collapse in a Newtonian (top) and viscoelastic fluid (bottom). The red and blue regions show areas of high and low pressure, respectively.



Statistics

The Statistics group is active in advancing the theory of statistics in multivariate analysis, probabilistic number theory, stochastic processes, stochastic optimisation and time series analysis. Statisticians within the School have been prominent in collaborating with researchers in other disciplines. Locally there are strong links with Cardiff School of Medicine working on applications of multivariate statistics and time series analysis in bioinformatics; with Cardiff School of Engineering in the areas of image processing and stochastic global optimisation of complex systems; and with Cardiff Business School in the analysis of economics time series. The group also forms a key part of the Centre for Optimisation and its Applications based at Cardiff University. This is an interdisciplinary centre which encourages joint research and applied projects among members of the Schools of Mathematics, Computer Science and Business and the Manufacturing Engineering Centre. The group is active in various areas of applied research and frequently engages in consultancy and contract work.

Operational Research

The Operational Research group has interests in both the theoretical and practical aspects of the subject area; with particular expertise in queueing theory, simulation, healthcare modelling, epidemiology, scheduling, heuristics and timetabling. The prominence of Operational Research at Cardiff is reflected by the success of being awarded the largest ever research grant ever awarded in the UK for Operational Research as part of the LANCS consortium (with three other universities). This has enabled the Operational Research group to more than double in size and is now the largest subject group of academic staff within the Cardiff School of Mathematics. In addition to offering a range of Operational Research modules at undergraduate level, the group runs two MSc programmes in Operational Research, Applied Statistics and Risk as well as supervising a number of PhD students.

The research groups are regular hosts to visiting scholars from many parts of the world.



More online at:

www.cardiff.ac.uk

www.cardiff.ac.uk/opendays

www.ucas.com

Admissions

Application Process and Entry Requirements

Applications must be made through the UCAS scheme, details of which can be found at: www.ucas.com

Applications can be made either in the English or the Welsh language. The UCAS code and number for Cardiff University is CARDF C15.

Once we receive your application, you will normally be invited to visit the School on one of our Open Days. The visit includes a guided tour of the School and the University campus, allowing you to see facilities such as the library and Students' Union. You also have the opportunity to talk to present students and find out what life as a mathematics student is really like. There is usually an informal interview with a mathematics lecturer that enables you to raise any questions you may have. If you are unable to visit we will consider making an offer based only on the details on the UCAS application form.

Within a few days of your visit, you will be informed of the details of your offer. Most of our offers are conditional on A-level results.

The standard A-level offer for all Single Honours Mathematics degree programmes is **AAB**, with an **A** in Mathematics other than the MMath for which the offer is **AAA**. A-levels in General Studies are not counted towards this offer. 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 normally required. For applicants taking the Welsh Baccalaureate, the standard offer is a Pass in the Welsh Baccalaureate and AB at A-level (AA for MMath) with the A in Mathematics.

The corresponding IB offer is 34 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, etc are also welcomed. Overseas students are also welcome and we would consider your qualifications on a case by case basis.

Open Day

A University-wide Open Day is held in the Spring of each year and provides the opportunity to visit all departments in addition to residences, the Students' Union and sports facilities. The Admissions tutors are also very willing to discuss queries, by telephone, letter or email.



Applicants with Disabilities/Equal Opportunities

Every application is considered on an individual basis. We welcome applications from students with disabilities. Applicants with special requirements that relate to a disability or medical condition are encouraged to contact the Disability Advisor, who can discuss individual needs. Where appropriate, informal visits can be arranged in which applicants can view accommodation and meet academic staff in addition to staff from the Disability Service. The Disability Advisor can be contacted at Disability & Dyslexia Service, Student Support Centre, 50 Park Place, Cardiff CF10 3AT. Tel: 029 2087 4528. Email: disability@cardiff.ac.uk

All applicants are afforded equal opportunity, irrespective of their age, colour, race, ethnic or national origins, sex, sexual orientation, marital status, family responsibilities, physical or sensory disabilities, or their political or religious beliefs. Diversity of background among Cardiff's mathematics students is encouraged and all selection decisions are made strictly on the basis of merit.

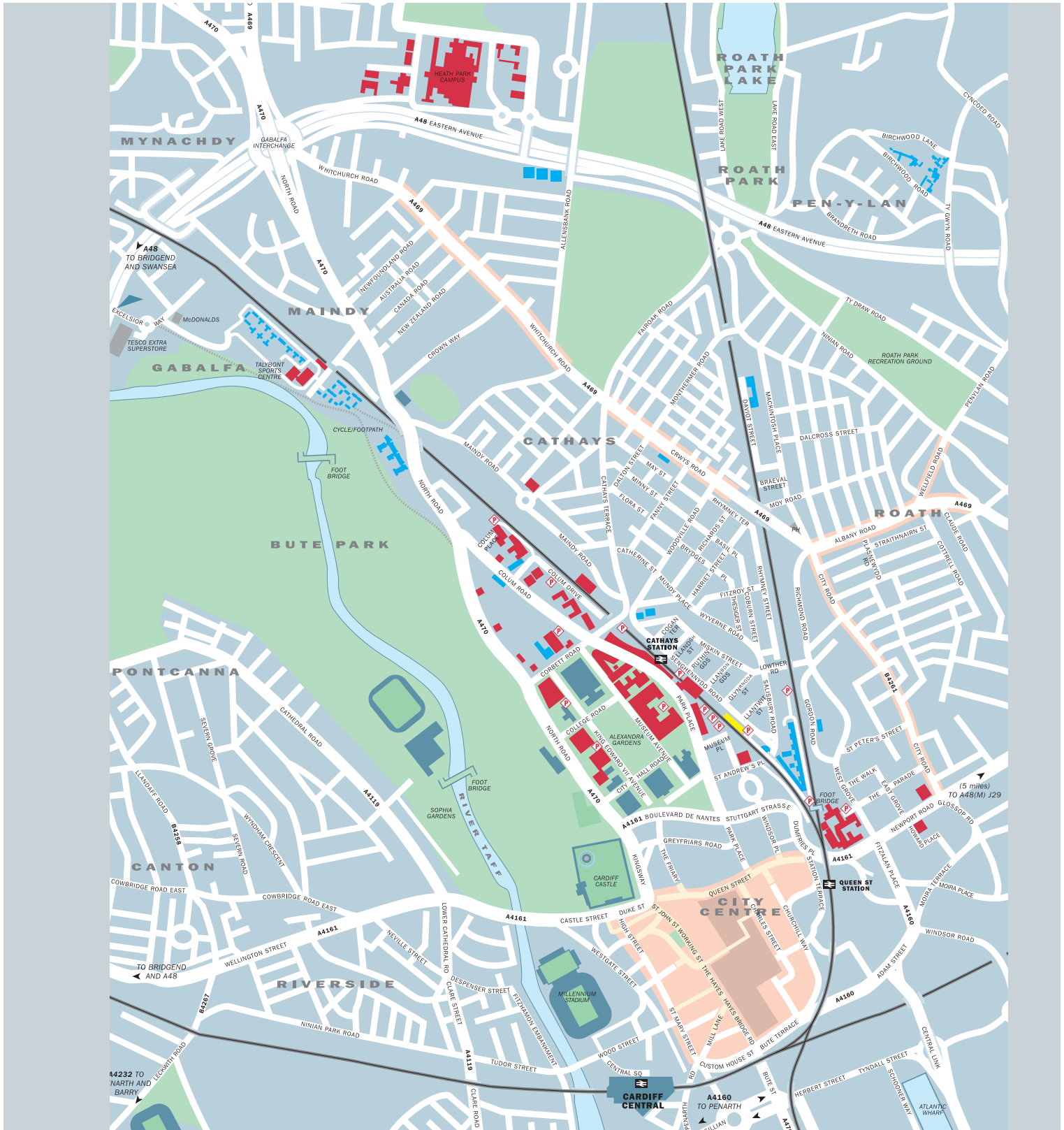
Notes for Welsh Language Applicants

We recognise that if you are a Welsh speaker you may feel more comfortable speaking to a Welsh speaking personal tutor. Provided there are Welsh speaking members of staff in your subject area, every effort will be made to allocate a Welsh speaker to you. If you wish, you can also submit your assessed work and take your examinations through the medium of Welsh, regardless of the language of tuition of the course you are following. Some of the accommodation at Senghennydd Court and Talybont student residences has been allocated for Welsh speakers and learners who would like to be grouped together. If you would like to take advantage of this please make a note of this on your accommodation form.

How to Find Us

Key

- Cardiff School of Mathematics
- University Buildings
- Student Residences





More online at:

www.cardiff.ac.uk/fees

www.cardiff.ac.uk/scholarships

www.direct.gov.uk

www.studentfinancewales.co.uk

Tuition Fees

The tuition fee arrangements in Wales are different from those in England and elsewhere in the UK. If you are thinking of applying to Cardiff University you should carefully read the fee information that relates to your situation. More detailed information is available on our website at:

www.cardiff.ac.uk/fees

I currently live in Wales

You will be charged an annual fee of approximately £3,225pa. However, you will be eligible for an annual £1,940 fee grant from the Welsh Assembly. This means that you will pay an annual fee of approximately £1,285 although this will not be charged up front. Instead payment will be deferred until after you have graduated and are earning more than £15,000pa.

I currently live in England (or elsewhere in the UK)

You will be charged an annual fee of approximately £3,225pa. However, this fee will be deferred until after you have graduated and are earning more than £15,000pa.

I am living outside the UK but inside the EU

You will be charged an annual fee of approximately £3,225pa. However, you will be eligible for an annual £1,940 fee grant from the Welsh Assembly. This means that you will pay an annual fee of approximately £1,285 although this will not be charged up front. Instead payment will be deferred until after you have graduated and are earning more than £15,000pa.

I am living outside the EU

Details are available on the following website:

www.cardiff.ac.uk/international

For further information contact:

Dr Jonathan Thompson or Mrs Vicky Reynish

Admissions Tutors

Cardiff School of Mathematics

Cardiff University, Senghennydd Road

Cardiff CF24 4AG

Tel: 029 2087 5524/0694

Fax: 029 2087 4199

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The pulp used in the production of this paper is obtained from sustainably managed Scandinavian tree farms and utilizes an elementary chlorine free bleaching process.

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Important information. Please read carefully.

The University offers the information contained in this brochure as a guide only. It does not constitute a contract and is not binding on prospective students, students or the University. While the University makes every effort to check the accuracy of the factual content at the time of publication, some changes will inevitably occur in the interval between publication and the academic year to which the brochure relates (Entry 2011). For example, courses, entry requirements and typical offers may have changed in line with market and student demand, and research development. Applicants should not therefore rely solely on this brochure and should visit the University website (www.cardiff.ac.uk) for up-to-date information concerning course content, accreditation, and entry requirements for the relevant academic year when considering applying to the University.



This document can also be made available in large print (text), Braille and on audio tape/CD. To request an alternative format, please contact Laura Roberts:

Tel: 029 2087 4839

Email: RobertsL9@cardiff.ac.uk



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www.cardiff.ac.uk/maths



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