



Department  
of Mathematics

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Undergraduate studies in

# Mathematics

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## Important information

The programme information published in this brochure was correct at time of going to print (June 2022) and may be subject to change. Prospective students are advised to check the definitive programme information, including entry requirements, that is available on our website before making an application, to ensure that the programme meets their needs.

# Welcome to the Department of Mathematics.

"Mathematics by the Sea" has been part of Aberystwyth University since it first opened its doors in 1872. In fact, Aberystwyth was the first University to teach Mathematics in Wales. Teaching and research methods have certainly changed over the last century, yet our aim remains the same – to provide the highest quality education possible, in a friendly and supportive environment.

We are rated Top in the UK for Student Experience and Teaching Quality for the subject of Mathematics (The Times and Sunday Times, Good University Guide 2021)

We are a close-knit department that focuses on our students' learning, development and satisfaction during their time here in Aberystwyth. We teach using a mixture of lectures, small group tutorials and practicals, with the aim to both explore rich Mathematical structures and to translate Mathematics into practical applications.

Our single honours Mathematics courses, for example the three year

(G100) scheme and the four year Integrated Masters (G103) scheme, are accredited by the Institute of Mathematics and its Applications, meaning that you will meet the educational requirements for the status of Chartered Mathematician. These courses are built on a foundation of algebra and calculus, and lead to a wide choice of final year options in subjects such as mathematical analysis, biological statistics, fluid and solid mechanics, and operator algebras. In addition to our single-honours courses, there are a selection of joint-honours courses to choose from, with subjects such as Physics, Computer Science, Business and Languages.

Aberystwyth itself is a beautiful seaside town that combines a vibrant student experience with a naturally stunning environment.

I hope you enjoy reading through our brochure and I look forward to meeting you in Aberystwyth soon.

**Professor Simon Cox**  
Head of Department



# Why study Mathematics?

Mathematics is living discipline that has evolved through the ages. It is one of the supreme achievements of the human mind. Not only is it a scientific discipline in its own right, it influences all other scientific subjects. Science without mathematics is unthinkable.

Within the subject of Mathematics there are many subdisciplines, broadly categorised as Pure Mathematics, Applied Mathematics (including Mechanics) and Statistics. You may choose to study modules in all three areas, or develop your interests in a particular branch of Mathematics. You may also choose to focus on the use of Mathematics in cognate areas of study through our bespoke degree schemes in Financial Mathematics, Mathematical and Theoretical Physics, and Data Science, which combines elements of Computer Science with Statistics.

We offer a wide range of possibilities, including combinations with closely-related subjects such as Physics and Economics. For those who foresee a career in teaching, it is possible to study Mathematics and Education, and we also offer joint degrees with a Modern Language, with History and with Drama.



# Employability

A Mathematics degree will prepare you for a wide range of career destinations where a high degree of analytical and computational skills are especially valued. Areas include accountancy, banking, risk analysis, actuarial work, financial management, investment analysis, information technology and statistical analysis.

Further study at postgraduate level will open doors into research, lecturing and teaching, and our Integrated Masters degrees will set you on course to achieve this.

To further enhance your employability prospects, some of our courses are available with an integrated year in industry, ensuring that you graduate with the necessary skills and experience to give you a head start when entering the job market. The University also offers the Year in Employment Scheme (YES), enabling students from any subject discipline to undertake a year in employment between the second and third year of their undergraduate study.

A Mathematics degree will equip you with a range of transferable skills including:

- research and data analysis skills
- enhanced mathematical and computational skills
- effective problem-solving and creative thinking skills
- a thorough grounding in information technology skills
- the ability to work independently
- time-management and organisational skills, including the ability to meet deadlines
- the ability to express ideas and communicate information in a clear and structured manner, in both written and oral form
- self-motivation and self-reliance
- teamworking, with the ability to discuss concepts in groups, accommodating different ideas and reaching agreement.



# Our courses

## Single Honours

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# Data Science

## BSc (Hons)

With integrated year in industry (7G74)

Data Science is an exciting new discipline where computing and mathematics meet. Our Data Science degree addresses how we can make sense of the terabytes of information that our computers are collecting every day. It can be used to predict what people will want to buy or where we need to put more money into the NHS to make it more effective, for example.

Taught jointly by research-active academics in the Department of Computer Science and the Department of Mathematics, the Data Science degree gives you a firm grounding in the underlying theory of data science as well as the practical skills to apply that theory in real-world data analytics. You will learn how to design and carry out analysis of large sets of data and draw implications from the results, giving you the skills needed to succeed in this industry.

Opportunities for Data Science students at Aberystwyth include:

- regularly updated laboratories providing access to a full range of computing environments including Windows, Linux and MacOS
- modules from both departments that focus on dealing with patterns in data
- studying a degree accredited by BCS – The Chartered Institute for IT
- being taught by lecturers whose research specialties include statistics, data analysis and mathematical modelling.

### Employability

The shortage of skilled data scientists means that graduates in this area are expected to be in great demand over the next few years. Our graduates will have experience of both the statistics and the computer science needed by data scientists. The year in industry option means that you can finish your degree having already had a year's experience of working in data science, making you even more attractive to employers.

## Module list

Below is an indicative list of modules that you may study on this course.

### First year:

- Algebra \*
- Calculus \*
- Introduction to Computer Infrastructure
- Introduction to Programming \*
- Probability \*
- Further Algebra and Calculus \*
- Mathematical Analysis \*
- Programming Using an Object-Oriented Language \*
- Statistics\*.

### Second year:

- Algorithm Design and Data Structures \*
- Applied Statistics
- Distributions and Estimation
- Introduction to Numerical Analysis and its Applications \*
- Modelling Persistent Data \*
- Linear Algebra \*
- Software Engineering\*.

### Final year:

- Agile Development and Testing
- Linear Statistical Models
- Major Project\*.

See our website for the optional modules you may select to develop your specialist interests.


\* also available partially or entirely through the medium of Welsh.


## Accredited by:



## Key Facts

 Degree type: BSc.

 UCAS Code: 7G73 (7G74 with integrated year in industry).

 Duration: 3 years (7G74 is 4 years).

# Financial Mathematics

## BSc (Hons)

This bespoke degree will prepare you for work or professional study in the financial sector by teaching you core mathematical skills, including algebra, calculus and statistics, along with specialist mathematical techniques in a financial context.

You will acquire a solid understanding of the principles of financial accounting and management, along with specialist mathematical techniques in a financial context, for example, in stochastic modelling of the stock market, enabling you to gain a solid understanding of the principles of economics and of financial accounting and management.

Opportunities for Financial Mathematics students at Aberystwyth include:

- studying a course accredited by the Institute of Mathematics and its Applications, the UK's learned and professional society for mathematics, directly contributing to your recognition as a Chartered Mathematician
- benefitting from the expertise of lecturers in the Department of Mathematics and Aberystwyth Business School
- being taught by experts in their fields, at the forefront of research in mathematics, statistics and economics.

### Employability

On this course you will receive integrated training in the essential skills demanded by the financial sector from its graduate employees. Our graduates have found employment in accountancy, banking, risk analysis, actuarial work, financial management and investment analysis.

## Key Facts

 Degree type: BSc.

 UCAS Code: G1N3.

 Duration: 3 years.

## Module list

Below is an indicative list of modules that you may study on this course.

### First year:

- Algebra \*
- Calculus \*
- Fundamentals of Accounting and Finance \*
- Probability \*
- Differential Equations \*
- Accounting and Finance for Specialists
- Further Algebra and Calculus \*
- Mathematical Analysis \*
- Statistics \*.

### Second year:

- Applied Statistics
- Corporate Finance and Financial Markets
- Distributions and Estimation
- Introduction to Numerical Analysis and its Applications \*
- Intermediate Management Accounting
- Linear Algebra \*.

### Final year:

- Probability and Stochastic Processes
- Investments and Financial Instruments
- Stochastic Models in Finance.

For more details on the optional modules available, see the current list on our website, or contact us.

\* also available partially or entirely through the medium of Welsh.

### Accredited by:



# Mathematics

## BSc (Hons) / MMath (Hons)

The first two years of our Mathematics courses give you a broad introduction to important areas of mathematics, including algebra, calculus, geometry, statistics and mathematical analysis. You can then specialise and take advantage of our expertise by choosing from a wide range of optional modules.

We also offer additional Mathematics courses in Applied Mathematics/Pure Mathematics (G130), Mathematical Modelling (13GG), and Pure Mathematics/Statistics (GGC3). You can also study Mathematics with an Integrated Year in Industry (G10N).

The Mathematics MMath (G103) degree includes a fourth year to be taken after the three years of the G100 course, during which you will gain a deeper understanding of the subject through supervised project work and specialised modules that reflect the research interests of staff.

Opportunities for Mathematics students at Aberystwyth include:


- benefitting from the Department's long and distinguished history of, and commitment to, teaching excellence
- studying a course accredited by the Institute of Mathematics and its Applications, the UK's learned and professional society for mathematics, directly contributing to your recognition as a Chartered Mathematician
- being taught by experts in their fields, at the forefront of research in mathematics and statistics.

### Employability

A degree in Mathematics is fundamentally important to a range of sectors, including science, engineering, technology and finance. Our graduates typically find work in the financial sector, engineering, teaching, and as professional statisticians, and many go on to further study. Some have found employment with companies such as LV= and Rolls Royce. The MMath course leads to additional opportunities in Mathematics research and research project skills. By taking the option of a year in industry you will enhance your skills in applying the Mathematics you have learned to real-world situations and gain first-hand experience of the work of a mathematician in industry.

## Key Facts

 **Degree type:** BSc/MMath.

 **UCAS Code:** G100 (G103 MMath) (G10N with integrated year in industry).

## Module list

Below is an indicative list of modules that you may study on this course.

### First year:

- Algebra \*
- Calculus \*
- Classical Dynamics \*
- Coordinate and Vector Geometry \*
- Probability \*
- Career Planning and Skills Development \*
- Differential Equations \*
- Mathematical Analysis \*
- Statistics \*.

### Second year:

- Applied Statistics
- Introduction to Numerical Analysis and its Applications \*
- Complex Analysis \*
- Linear Algebra \*.

### Final year

Will consist entirely of optional modules, examples of which include:

- Group Theory
- Graphs and Networks \*
- Norms and Differential Equations \*
- Partial Differential Equations \*
- Linear Statistical Models
- Asymptotic Methods in Mechanics
- Stochastic Models in Finance.

### MMath additional year:


- Major project
- Minor project.

For more details on the optional modules available, see the current list on our website, or contact us.

\* also available partially or entirely through the medium of Welsh.

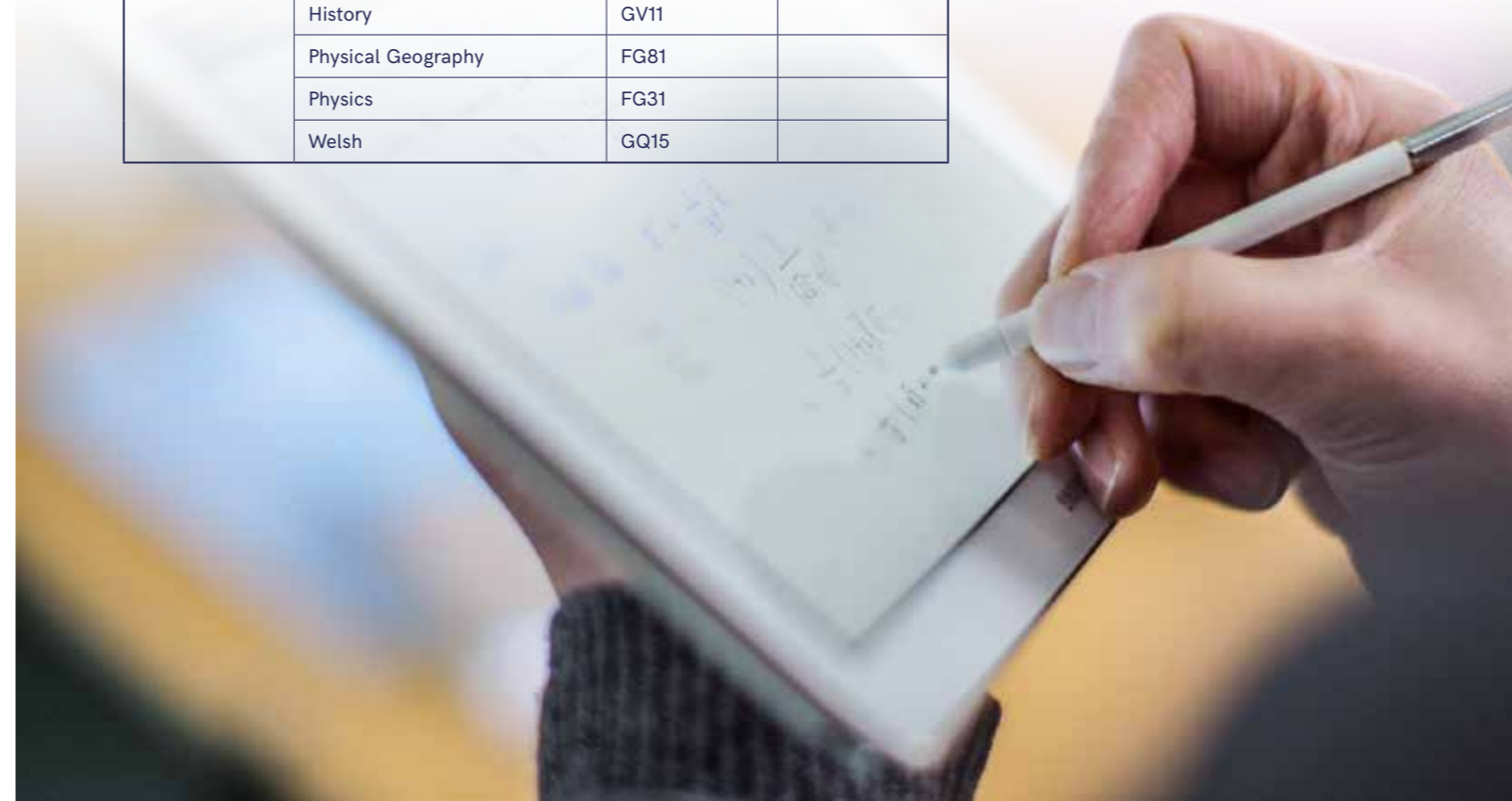
## Accredited by:



 **Duration:** 3 years/4 years.

# Joint Honours & Major/Minor

Subject	Available with...	Joint Honours	Major/Minor
Mathematics	Accounting and Finance	GN94	
	Business and Management	GN11	
	Computer Science	GG14	
	Drama and Theatre	GW14	
	Economics	GL91	
	Education	GX13	G1X3
	Film and Television Studies	GW16	
	French	GR11	
	History	GV11	
	Physical Geography	FG81	
	Physics	FG31	
	Welsh	GQ15	



# Financial Mathematics

## (with integrated foundation year)

### BSc (Hons)

Designed for students who do not have a sufficient or relevant academic background in Mathematics, the integrated foundation year course is the perfect option to access this highly sought-after degree scheme. In the foundation year, you will be brought up to speed on the fundamentals of mathematics and finance, providing a solid base for you to successfully progress through the full undergraduate degree.

Financial Mathematics (with integrated foundation year) will prepare you for work or professional study in the financial sector by teaching you core mathematical skills, including algebra, calculus and statistics, along with mathematics in a financial context, for example, in stochastic modelling of the stock market, enabling you to gain a solid understanding of the principles of economics and of financial accounting and management.

Opportunities for Financial Mathematics (with integrated foundation year) students at Aberystwyth include:

- studying a course accredited by the Institute of Mathematics and its Applications, the UK's learned and professional society for mathematics, directly contributing to your recognition as a Chartered Mathematician
- benefitting from the expertise of lecturers in the Department of Mathematics and Aberystwyth Business School
- being taught by experts in their fields, at the forefront of research in mathematics, statistics and economics.

#### Employability

On this course you will receive integrated training in the essential skills demanded by the financial sector from its graduate employees. Our graduates have found employment in accountancy, banking, risk analysis, actuarial work, financial management and investment analysis.

### Key Facts



Degree type: BSc.



UCAS Code: G1NF.



Duration: 4 years.

### Module list

Below is an indicative list of modules that you may study on this course.

#### First year:

- Foundations of Mathematics 1 & 2
- Introduction to Mathematical Methods 1 & 2
- Economics, Finance and Accounting for Business
- Introduction to Statistics
- Mathematics Tutorial.

#### Second year:

- Algebra \*
- Calculus \*
- Fundamentals of Accounting and Finance \*
- Differential Equations \*
- Accounting and Finance for Specialists
- Further Algebra and Calculus \*
- Mathematical Analysis \*
- Statistics \*.

#### Third year:

- Applied Statistics
- Corporate Finance and Financial Markets
- Distributions and Estimation
- Introduction to Numerical Analysis and its Applications \*
- Intermediate Management Accounting
- Linear Algebra \*.

#### Final year:

- Probability and Stochastic Processes
- Investments and Financial Instruments
- Stochastic Models in Finance.

For more details on the optional modules available, see the current list on our website, or contact us.

\* also available partially or entirely through the medium of Welsh.

### Accredited by:



# Mathematics

## (with integrated foundation year)

### BSc (Hons)

Designed for students who do not have a sufficient or relevant academic background in Mathematics, the integrated foundation year course is the perfect option to access this highly sought-after degree scheme. In the foundation year, you will be brought up to speed on the fundamentals of mathematics and finance, providing a solid base for you to successfully progress through the full undergraduate degree.

Financial Mathematics (with integrated foundation year) will prepare you for work or professional study in the financial sector by teaching you core mathematical skills, including algebra, calculus and statistics, along with mathematics in a financial context, for example, in stochastic modelling of the stock market, enabling you to gain a solid understanding of the principles of economics and of financial accounting and management.

Opportunities for Financial Mathematics (with integrated foundation year) students at Aberystwyth include:

- studying a course accredited by the Institute of Mathematics and its Applications, the UK's learned and professional society for mathematics, directly contributing to your recognition as a Chartered Mathematician
- benefitting from the expertise of lecturers in the Department of Mathematics and Aberystwyth Business School
- being taught by experts in their fields, at the forefront of research in mathematics, statistics and economics.

#### Employability

On this course you will receive integrated training in the essential skills demanded by the financial sector from its graduate employees. Our graduates have found employment in accountancy, banking, risk analysis, actuarial work, financial management and investment analysis.

### Key Facts



Degree type: BSc.



UCAS Code: G10F.



Duration: 4 years.

### Module list

Below is an indicative list of modules that you may study on this course.

#### First year:

- Foundations of Mathematics 1 & 2
- Introduction to Mathematical Methods 1 & 2
- Economics, Finance and Accounting for Business
- Introduction to Statistics
- Mathematics Tutorial.

#### Second year:

- Algebra \*
- Calculus \*
- Fundamentals of Accounting and Finance \*
- Differential Equations \*
- Accounting and Finance for Specialists
- Further Algebra and Calculus \*
- Mathematical Analysis \*
- Statistics \*.

#### Third year:

- Applied Statistics
- Corporate Finance and Financial Markets
- Distributions and Estimation
- Introduction to Numerical Analysis and its Applications \*
- Intermediate Management Accounting
- Linear Algebra \*.

#### Final year:

- Probability and Stochastic Processes
- Investments and Financial Instruments
- Stochastic Models in Finance.

For more details on the optional modules available, see the current list on our website, or contact us.

\* also available partially or entirely through the medium of Welsh.

### Accredited by:



# Studying through the medium of Welsh

Aberystwyth University offers a high level of provision for students to be able to study through the medium of Welsh - one of the highest in Wales.

The Department of Mathematics provides all students with the opportunity to study part of their course through the medium of Welsh by offering a number of modules which can be studied partially or entirely through the medium of Welsh. You can study some modules in Welsh, even if you are studying mainly in English, and you can choose to submit your coursework in Welsh.

There are opportunities for students who are fluent in Welsh, in addition to those who are less confident or are learners. There are variations in undergraduate course modules and the amount that can be studied through the medium of Welsh.

'Addewidion Aber' is Aberystwyth University's commitment to develop Welsh medium provisions following the University's Welsh-medium academic strategy. This is the most comprehensive plan of its kind by any university in Wales.

These pledges highlight what is special about Aberystwyth and how the University offers a complete Welsh experience to students, including:

- Flexible opportunities to study through the medium of Welsh in all departments
- Guaranteed Welsh-speaking Personal Tutor
- Bilingual work experience
- Guaranteed Welsh medium accommodation
- Support for learning and improving your Welsh
- Money in your pocket for following between 5 and 40 credits in Welsh
- Free membership of the Welsh Students' Union (Undeb Myfyrwyr Cymraeg Aberystwyth)
- Space for Welsh-medium societies to meet.



# Scholarships

Alongside Aberystwyth University scholarships such as Entrance Scholarships, Merit Awards, Academic Excellence Scholarships and Welsh-medium study Scholarships, we also offer our own Departmental Scholarships.

These are designed to encourage high-calibre and enthusiastic students to pursue a degree in Mathematics.

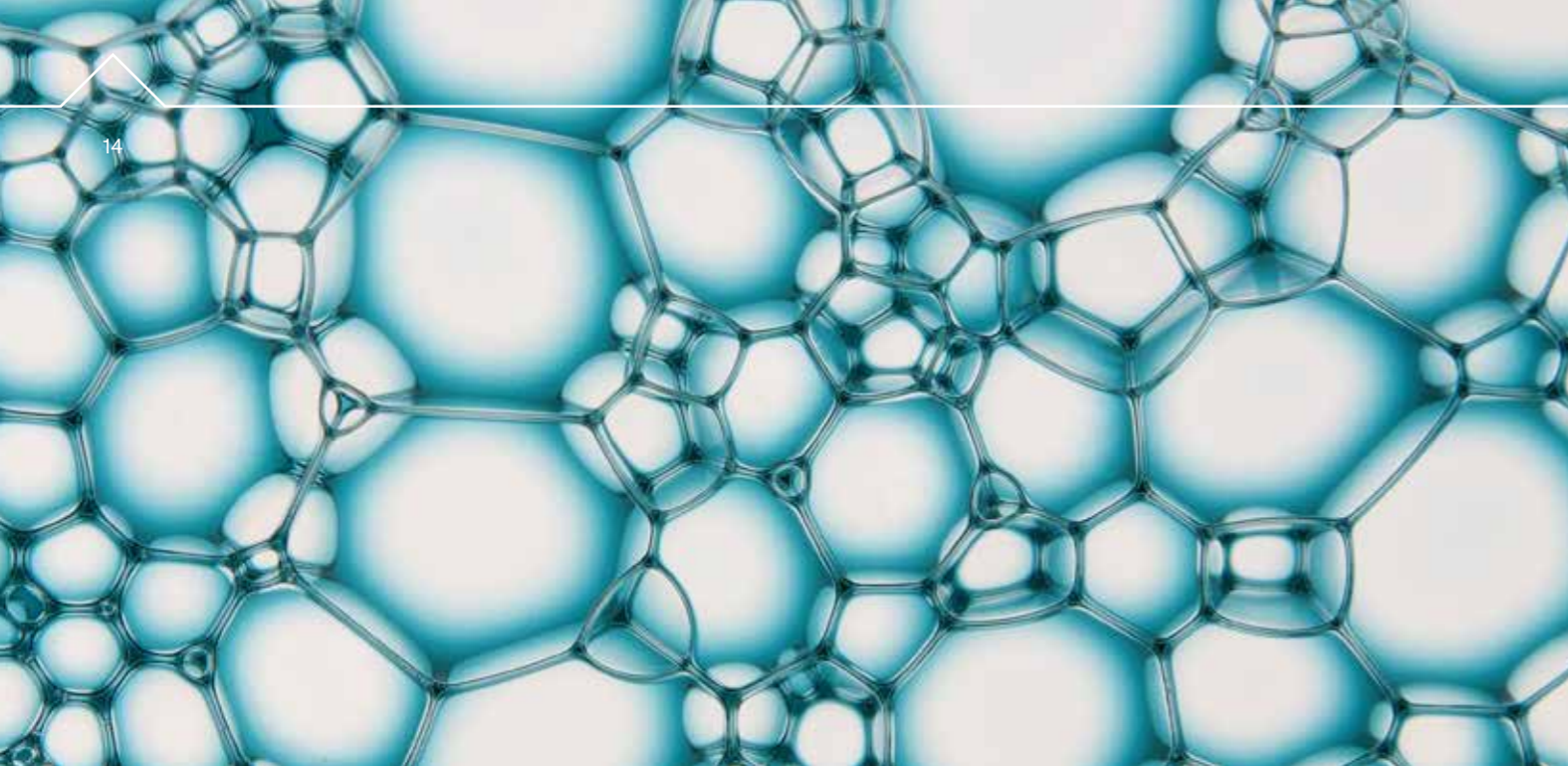
To qualify, an applicant must be either in receipt of a university Entrance Scholarship in Mathematics, or achieve grade A\* in A level Mathematics.

Successful applicants receive £500 per year for single honours courses and £250 per year for joint honours courses. Retention of the award requires that students achieve an average of at least 70% in Mathematics modules each year.

Information on all other University Scholarships can be found online at [www.aber.ac.uk/scholarships](http://www.aber.ac.uk/scholarships)







# Research

Our Mathematics lecturers are research-active in their respective fields and enjoy helping students develop their knowledge and understanding of Mathematics. The Department's research was rated as Internationally Excellent in the last UK-wide assessment, so you are guaranteed to be taught by experts.

We work in the following areas of Mathematics research:

**Mathematical Modelling of Structures, Solids and Fluids** – covering diverse problems in solid and fluid mechanics and mathematical analysis. Examples of applications include weather forecast error, hydraulic fracture, and foam treatments for varicose veins. Our approaches include modelling, analysis, numerical simulation and experimentation.

**Quantum Structures, Information and Control** – using functional analysis, statistics, and operator theory to study for example how quantum systems interact with their environment. As well as contributing to the link between algebra and topology, the group studies the emergent field of quantum control engineering.

**Statistics** – interests include the application of statistical shape analysis to biological data sets and the statistical analysis of high-dimensional biological data sets. This is interdisciplinary work with colleagues in Computer Science and Biology, for example on nitrogen uptake by wheat seedlings and on a plant's internal clock.



# Student profile



Alex Kendal

BA Mathematics / Drama and Theatre Studies (GW14) Graduate

"All of the staff in the Maths department are fantastic. The lecturers are all research active too, so they are teaching you about topics they are really interested in. There is an open-door policy so if you ever have a problem with an assignment or exam revision question you just have to ask.

Aberystwyth is a place of natural beauty where you can leave your lecture at 6pm, walk a mile into town and see some of the most beautiful sunsets."

## AberMathsSoc – Student Society

We also encourage our students to join the Aberystwyth Mathematics Society, with which the lecturers have close links. This is a great society through which to meet your peers, make friends for life, have fun on socials and benefit from academic and revision support in and around exams. You can find out more by searching "aber maths soc" on Facebook.



# Global opportunities



Aberystwyth's Global Opportunities team offer an exciting range of options for you to go overseas as part of your degree: from short courses and volunteering opportunities in the summer, to a full semester or year abroad studying your chosen subject at one of our partner universities.

The University also offers a number of courses which include an integrated year studying abroad, enabling you to study at one of our European or international partner universities for one or two semesters during your third year, returning to Aberystwyth for your final year and graduation.

Reports have shown that students who study abroad are more attractive to employers and earn more than their peers. Take advantage of the opportunity of a lifetime while improving your critical skills by choosing to study abroad.

## Language students

Students who study one or more languages at Aberystwyth spend an additional year studying or working abroad. Time spent abroad improves fluency and confidence in the languages chosen and immerses students in the host culture.



Ottawa

Thailand

Tromsø

Washington, DC

Hong Kong

Japan

Montana

Taiwan

Sydney

# How to apply

Once you've decided what course you want to study and where, you'll be able to start the university application process. Here's a brief overview of the process and our procedures here at Aberystwyth.

## 1 Apply through UCAS.com

Deadline 15 January. Aberystwyth University institution code: A40.

**Top tip:** You'll be given a 10-digit UCAS ID number. Keep this to hand as you'll be asked for it many times.

## 2 The University will consider your offer

**Top tip:** Use UCAS Track to keep an eye on your application. At Aberystwyth we aim to make a decision within four weeks.

## 3 The offer will show on UCAS track

## 4 Decide where to go

Once you've received all your offers, you'll need to decide which university you want to go to, within a set time. This is when you'll need to note which universities will be your firm and insurance choices.

## 5 Accommodation

Once you've chosen your firm/insurance choice you'll be able to apply for your accommodation (April onwards).

## 6 Results day

UCAS Track will confirm your offer of a place. If you're not clear what the offer is, contact the university directly. Make sure you're not on holiday on results day. If you don't get the grades you've hoped for, you may want to consider entering Clearing.

## 7 Start packing!





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