Discover your world

Mathematics & Statistics
The place  
for you

From the moment you start your course, you will be part of a community that supports you to secure your future as a Lancaster graduate. We will offer you regular meetings with tutors and lecturers, and our strong academic support systems are there to ensure you stay on track to realise your potential. You will study and grow as a person in a vibrant and safe environment, enjoying a wide range of extracurricular activities, including our very own Maths & Stats Society.

We expect you to work hard, but we will help you gain the full benefit from your efforts. We cover a broad range of topics in the earlier years, while allowing specialisation later on. By your final year, you will be studying material directly influenced by our research interests in algebra, analysis, discrete mathematics, probability and statistics. Flexibility is built into your course, with our major/minor system allowing study of a second subject in your first year.

The pace will be challenging but the results will be well worth it.

Come and start your journey with us.

Dr Alexander Belton
Head of Department
#9
In the UK for Mathematics according to The Complete University Guide (2020)

World ranked
Top 100 for Statistics and Top 300 for Mathematics in the 2019 QS World Rankings

World-leading research
We were ranked #5 in the UK for research in the 2014 REF. This means that you will be taught by some of the world’s leading researchers in mathematics and statistics.

For the professional
Choosing where to study can be an overwhelming experience. You know you want to focus on maths, but how do you know which course is right for you? As a sign of course quality, accreditations from professional bodies are a great place to start.

The Royal Statistical Society (RSS) and/or the Institute of Mathematics and its Applications (IMA) accredit all of our single-honours degree pathways in Mathematics and Mathematics with Statistics, with re-accreditation pending from 2023.

For you, this means that our degrees demonstrate both a high level of competency and professionalism in the area of mathematics. Professional bodies open doors to several networks should you choose to engage, and are well recognised by employers.

Royal Statistical Society
Through the RSS, you may be eligible for GradStat status (subject to criteria fulfilment) - our dedicated Teaching Office will help you select the right modules. If you’re thinking about work as an actuary then (subject to satisfactory academic performance) you may be exempt from the probability and statistics exam of the Institute and Faculty of Actuaries. RSS also sponsors a Royal Statistical Society prize for an exceptional student or students graduating from its accredited courses – another chance for recognition.

Institute of Mathematics & its Applications
The IMA is a chartered professional body for mathematicians in the UK. All of our single honours MSci schemes meet the requirement for gaining the CMath designation which is a professional status in advanced mathematics which employers will value.

For more information, please visit www.lancaster.ac.uk/maths
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How you’ll learn

**Lectures**
Lectures will introduce you to course content and you will usually have four of these per week in each module. They are taught in large groups with fellow students from across the year group.

Whilst this form of teaching is mostly led by the lecturer, we do encourage you to actively participate. We will also provide you with lecture notes which have space for annotation during the lecture. Our students find this active form of learning useful for developing their knowledge and understanding of lecture material.

**Problem solving**
In your first year, we run problem solving classes designed to develop your skills to tackle university-style mathematics. Working in small groups, you will apply your mathematical knowledge to a set of problems.

**Computer labs**
Some practical work is undertaken in specialist computer labs. This involves working with statistical and mathematical software to develop skills and enhance your employability.

**Workshops**
Our weekly workshops are designed to give the opportunity for enhanced support and guidance. You will work in small groups with specialist tutors to develop knowledge and understanding of module content and practise applying the skills you have gained.

**Assessment**
Completing assessments is a key part of your learning. Alongside main exams, you will also complete weekly or fortnightly homework sheets for your modules. These allow you to monitor your progress and identify areas to work on with your workshop tutor.

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### A place for Rhys

**Rhys Warham, studying BSc Mathematics and Statistics, felt at home straight away in Lancaster.**

**When did you know that Lancaster was the right place for you?**
When I came to deciding on a university, I wasn’t sure - I went all around the country. I think after I’d been to a few, I realised that I liked a campus university. When I came here, I got that feeling - walking around the place I got a different sort of buzz to what I got going to other universities.

**What do you like about compus universities?**
Half of it is the atmosphere - being able to walk to a lecture and see familiar faces on the way. And, it’s secure - walking say to and from the library later on at night. There’s a buzz around the place that you probably won’t get at a city university.

**Favourite part of your course?**
I think this year (third year) with the optional modules. I’ve done largely statistics. The highlight was a project for the 391 module, which was supervised by Dr Andrew Timman - the opportunity to delve deeper into something and do something that interests me.

**What has surprised you most about Lancaster?**
I knew about the collegiate system, but just how involved you can get and how many opportunities there are to do things outside of your degree surprised me. People talk about student lifestyle and societies and all these opportunities, but things like Colleges, Roses (Sport Competition) and just all those extra opportunities to enhance your experience - there’s always something going on.

**What’s it like to study maths day-to-day?**
There’s a lot of freedom. There’s a nice balance between lectures and there’s a lot of the studying in the workshops and that side of the learning. I think it’s the subject where you learn it from doing it yourself. There’s a lot of time spent outside of lectures as opposed to in lectures, like doing worksheets in workshops with a lecturer.

**Describe the difference between each year?**
The first two years cover a bit of everything. The first year you do the Math 100 pathway and Math 110, which is very different. Math 100 is bringing everyone to the same level consolidation of the higher end A level work that you’ve done. Math 110 is your first real taste of what university maths is like. A lot more emphasis is on proofs for example, rather than answering specific questions in one context.

Your second year largely builds on what you did in your first year. So for example, you do Probability 1 in your first year, and then Probability 2 in your second year. Third year, now you’ve had that taste of everything, is when the freedom comes to explore the area that you enjoy most, or again do a bit of everything - it is entirely your choice which you want to do or not.

**How have you found living away from home and making new friends?**
I think that was made easier by the college system. It’s nice when you’re coming here that you’re not just like ‘thousands of people here go and make friends. You come in and you do things with your flat, and then your house, and a couple of houses within your college, and then your college, and then a couple of colleges, and it just builds you in bit by bit. So, I think it’s made easier for you - that transition to being on your own.

With the Department talks during the welcome week, you know who people are in your lectures even before it comes to going to your first lecture. Everything’s been made as easy as it can be to move away from home and live with your friends for the first time.
Open door policy
Academic staff who teach on our undergraduate programmes have dedicated office hours for student queries and for additional support. You will receive feedback on all work submitted and teaching staff are happy to discuss this with you if you have any concerns.

Tutors and lecturers can help if you are struggling with a particular aspect of course material or if you just need some reassurance.

Teaching Office
This is your one-stop shop for enquiries ranging from timetabling and exams to module choices and coursework. The Office can also offer more general support, and if they don’t have the solution then they will know who to contact.

Our student society enhances the friendly and vibrant community of the Department.

LUMASS has students from across all year groups - anyone is welcome to join and it is a fantastic opportunity to be able to meet new people and to socialise with fellow students.

Social events are organised on a regular basis and there is something for everyone from quizzes to film nights. Other activities such as lectures from guest speakers are a great opportunity to expand your interests and knowledge in the subject area.

LUMASS also holds a weekly Maths Café. Third and fourth year students run this and you can go along and access additional support with coursework from your peers.

We are pleased that the society continues to grow and believe it is a great extra-curricular activity for our students.

Lancaster University
Maths & Stats Society
(LUMASS)

Outside of your studies, what do you like doing in Lancaster?

In my first year, I wasn't really involved with loads, I was quite focused on my course. I guess I was settling into university life, going out quite a bit and getting used to being away from home. This year I’ve been involved with quite a few societies – I'm president of the Women in Business Society, on the exec for the Maths Society, and I’m on the college JCR. I've enjoyed being busy this year, filling my days from start to finish, which I think also helps when you do live off-campus and you come in for lectures at various points in the day - you’ve got things to fill the gaps in between.

Lancaster, although not the biggest city, has plenty to do and the train links to Manchester and Liverpool are great. If you do want to go away for the weekend, there’s loads of places to go and things to do - but Lancaster’s got everything you need and I’ve never felt bored here.

How do you balance your time between your studies and extracurricular activities?

I think it’s just prioritising – I know for me the priority is definitely the course, so it’s making sure everything is done for that before I do the other things. If I take on a new role or society, I make sure that I’ve been doing everything else for a while and I know I can balance that and I’ve got time for everything else, rather than signing up for five new things at once and then being overwhelmed. Time management at uni is one of the most important things, and it does take a lot of planning and getting used to. I have a book, it’s what I call my brain in a book and it’s just everything I do and everything I need to do written in there - then I’ve got no excuse to forget things, and I know exactly what I’m doing and when I’m doing it.

A supportive learning environment
For more information, please visit www.lancaster.ac.uk/maths

Everyone is so friendly and welcoming. There is a lot of support on offer from lecturers, workshop tutors and your academic advisor which gives you confidence with your workload.”
Chloe Lawrence
Third Year, Cartmel College
BSc Hons Mathematics
Loving Lancaster

Laura Patterson has secured a graduate role after undertaking a 10-week internship with the Royal Bank of Scotland, Edinburgh.

What is your favourite part about studying at Lancaster University?
The diversity of opportunities at Lancaster has very much appealed to me during my time here. I have tried to make the most of these by taking part in everything from part-time work and volunteering, to societies. As a Student Ambassador and Tutor, I’ve met new people and formed friendships that I otherwise may not have had. The part-time jobs have provided me with the extra income that I worried about having before I came to university, as well as many great opportunities to network and impress interviewers for roles.

Tell us more about volunteering and societies
I have spent time volunteering in local schools both through my course and through the Students’ Union. Alongside this and football refereeing, I’ve dedicated lots of my spare time to volunteering for the Defying Dementia Student Society. I’ve been involved in this from the very start of my time at Lancaster, and raised over £3000 in my role as Events Manager.

My Lancaster experience has provided so many things to do that I never imagined I could do. I have been involved in making key influential decisions for the Students’ Union as Student Trustee on the board of trustees. I am also a co-opted member of the Early Career Mathematicians committee for the Institute of Mathematics and its Applications, something that I found out about through the Maths Department here. I joined the committee after attending a few of their conferences and networking with other members. I helped to organise a mathematical conference here at Lancaster University, improving my communication skills and working further with academics.

Do you feel the Department has supported you with employability and careers?
Lancaster has certainly helped me achieve all I have wanted outside of (hopefully) getting the degree I came here for and more. I have gained an insight experience at Deutsche Bank during the Easter break of second year, allowing me to see how an investment bank operates - including experiencing the technology department of the trading floor of the company, which was such a surreal experience!

How has this all prepared you for a future career?
Last summer, I spent 10 weeks as an intern at the Royal Bank of Scotland in Edinburgh. This took place during the World Cup, which added an extra element of excitement and bonding between interns. The internship had a three-stage assessment, and I successfully obtained a graduate job offer.

This meant that I had an offer for a job after university before even beginning my final year (providing I obtain a 2:2), which has been such a relief. This was all paid too, allowing me to save for my future.

Any advice for new students?
So, my advice would be to grab every opportunity you can, as you never know where it may lead. I discovered my love of maths here at Lancaster, and how to combine it with various other passions. This has led me to uncover key skills, such as work-life balance, time management and communication that I hope will serve me well in my future. I have been able to gain these skills by choosing a mathematics degree at Lancaster.
Study Abroad

A number of our degree programmes offer the opportunity to spend a year abroad studying at one of Lancaster’s partner institutions. Destinations vary each year, with past students staying in the USA, Canada, New Zealand and Australia.

Our partner universities are carefully selected to ensure that the course content of your third year complements the rest of your degree programme. You will study modules that are closely linked to those taught at Lancaster. However, you will also have the opportunity to study additional specialist modules offered by our partner universities.

The modules that you study during your year abroad will count towards your overall degree classification. We have a dedicated Study Abroad Director in our Department and you will be well supported throughout the process to ensure that you have the best possible experience.

A year abroad will highlight to potential employers that you are flexible, adaptable and independent. You will also demonstrate cultural awareness and the ability to work with people from a variety of backgrounds.

A world for Ben

These photos are all either at Western University in London (Canada), at Niagara Falls (only a couple of hours drive from London) or on trips that the university organised whilst I was there. One photo is of me and a guy who’s like a cult hero around London called Rick McGhee - he sings in a bar every Wednesday. There’s the ice hockey game of the London Knights, and the ones of skiing and dogs are in a place called Halliburton. Western ran a club called the Outdoors Club, and we stayed overnight in Halliburton.

There’s the frozen waterfall and icicles in a place called Webster’s Falls (also organised by Outdoors Club). The rest are shots from about campus – a year captured in a collage that I’ll never forget.

— Ben Webb, MSci Mathematics with Statistics (Study Abroad)
A degree in mathematics will provide you with both a specialist and transferable skill set sought after by employers across a wide range of sectors. The advanced numerical skills you will develop will prepare you well for career paths such as accountancy, finance and banking, whilst the logical and analytical skills you will gain could help you to pursue a career in business analysis, management consultancy or in government roles.

Careers support
We are committed to developing your employability skills. Our dedicated Careers Officer in the Department works in partnership with the University’s Careers Service to offer a range of workshops and talks on topics such as:

+ Job application processes – CVs and cover letters, interviews and assessment centres
+ Careers within specific relevant fields such as finance, research, statistics and teaching
+ Completing a PhD in mathematics or statistics
+ Career planning
+ Postgraduate study options

You can also access 1:1 appointments throughout the year through the University’s Careers Service. The Department promotes a range of opportunities to meet and network with employers through events both on and off campus. This includes our annual Science and Technology Careers Fair where a range of regional and national employers are invited onto campus to talk about the internship, placement and graduate opportunities available to students.

Interested in teaching?
The education sector has an increasing demand for mathematics graduates to inspire the next generation of students whether through teaching or in other education roles. Our third year module in Mathematical Education provide an insight into what it would be like to complete a PGCE qualification after your degree. You will learn about current and historic issues facing mathematics education, teaching strategies and learning methods.

Project Skills module
Our second year Project Skills module develops skills that will enhance your employability. This module includes coursework on scientific writing and using LaTeX software to prepare mathematical documents – complementing your pure mathematics and statistics knowledge.

You will also complete your own short project in either mathematics or statistics and will work on a group project with an academic supervisor, which will involve investigative research and presenting a conclusion.

Past projects have included:

+ Modelling premier league football
+ Higher dimensional kaleidoscopes
+ Risk factors for low birth weight
+ Secondary treatment in type II diabetes

Placement year
Choosing a Placement/Industry pathway degree involves spending the third year of your four year degree working full-time in a business. You will be supported throughout the placement process, receiving advice and support to help you find the right opportunity and to prepare for all aspects of the application process. You’ll also be supported throughout your time working on placement.

Many students find that a placement year helps them to decide which career path they would like to take, and the experience will give you a strong advantage when looking for employment opportunities after completing your degree.

Internship scheme
Undertaking relevant work experience while you are at university is extremely beneficial when applying for graduate level jobs. Through our Science and Technology Internship Scheme you can apply for paid work placements which give you the opportunity to practice the skills and knowledge learned during your degree. These opportunities can be both full and part-time, and range from 3 months to a year.

Skills for your future
For more information, please visit www.lancaster.ac.uk/maths
Abby Rozee, part of Bowland College, is in her final year studying Mathematics. She plays an active role in the Lancaster community through societies and has already secured a graduate position.

I came to Lancaster as the North West has always felt like a home away from home for me. Looking back, I couldn’t be happier with my decision.

The opportunities at Lancaster are near endless. I’ve been an active member of various societies, including the Cancer Research UK Society that a friend and I founded in our second year. These experiences gave me the confidence to know my strengths within a team environment – a valuable life skill.

The college system at Lancaster means that I always felt part of a community, and when times became tough there was always someone I could turn to for advice, particularly where careers are concerned. Every week I received emails about relevant career opportunities for me, and the Department held weekly lectures with advice and insights into many different career paths from experts in their respective fields.

Studying a BSc in Mathematics has given me so many options. I feel like I have really been able to explore many areas of maths such as statistics and probability, number theory and algebra. This has helped me to decide what I am passionate about and has led me to pursue a career in accounting.

The Careers Service has been a huge help, looking over my CV and arranging practice interviews so that I could secure the job that I’ve always wanted. And I got it! I am proud to be graduating this July with a job offer in hand for a career I am really excited about.

Lancaster is a great environment, not only to secure your degree (of course), but also to learn many of the skills necessary in a working environment post-study. The careers team are always holding events like the Future Women Leaders’ course that I was lucky enough to be selected for last year. Brilliant female speakers gave us motivation, advice and practical tips on how to succeed across a wide variety of industries.

If there is something that you want to work on and achieve whilst at Lancaster there will always be somewhere you can succeed. I have also had a few part-time jobs, within the University itself and elsewhere, whilst studying. These have been key to developing my time management skills, and I am here to say it really is possible to have it all – the degree, the job and some hobbies for fun too.

A career for Abby
For more information, please visit www.lancaster.ac.uk/maths

Our programmes

We offer degrees in Mathematics, Mathematics and Statistics and several combined courses detailed on the following pages.

Mathematics
BSc Mathematics - G100
MSci Mathematics - G101
BSc Mathematics (Placement) - G102
MSci Mathematics (Study Abroad) - G103

Mathematics with Statistics
BSc Mathematics with Statistics - G1G3
MSci Mathematics with Statistics - G1GJ
BSc Mathematics with Statistics (Placement) - GCG3
MSci Mathematics with Statistics (Study Abroad) - G1GH

Flexibility
It is possible to transfer between Mathematics and Mathematics with Statistics up until the end of the second year, subject to fulfilling progression criteria.

A place for Roland

Having lived in the south my entire life, I wanted to study in a completely new location to expand my horizons - living in Lancaster has definitely been a fun and unique experience.

I really enjoyed attending my workshops at the end of each week as it gave me the opportunity to speak with my tutors about any (many!) topics I struggled to understand. Some of my lecturers were my tutors so it also gave me the chance to get to know my tutors as well as my lecturers - which made me much more comfortable in asking any queries I had. I would like to pursue a career that allows me to apply the skills I have learnt here, such as problem-solving and data analysing.
Your first year

For the majority of our degree schemes, you will follow a common core first year programme. This involves two sets of modules and a minor subject.

**Math 100 Mathematical Methods**

**Calculus**
Calculus is concerned with derivatives (which measure rates of change) and integrals (which measure area) and is usually introduced as rules for differentiating or integrating simple functions. You will see how to use the notion of a limit to define derivatives and integrals for many more functions. You will also study complex numbers, which are important in themselves and also have practical uses (in electrical engineering, for example).

**Further Calculus**
The graphs of functions of two real variables look like surfaces, with hills, valleys and other features. This module extends calculus to deal with these, introducing partial derivatives, and explains how repeated integration may be used to calculate volume. You will also be introduced to techniques for solving elementary differential equations.

**Probability**
In this module you will explore the ideas of probability models, which characterise the outcomes of different types of experiment that involve a chance or random component.

**Statistics**
Statistical thinking plays a key role in addressing a scientific problem where the recorded data is subject to systematic and random variations. This module will provide you with the tools to formulate appropriate models and implement the associated critical techniques.

**Linear Algebra**
Matrices are a concise way of writing and solving sets of simultaneous linear equations, whose connection with lines and planes is established. You will explore how matrices can be used to represent certain transformations of the plane or space and show how these transformations can be characterised by the way they behave in special directions.

**Discrete Mathematics**
We talk about set theory and discuss the different types of infinite sets that exist. We also formally introduce functions and their properties, before going on to look at counting problems and methods to solve them, and ending with graph theory. Graphs have important applications in the design and understanding of the properties of systems such as the infrastructure powering the internet, social networks such as Facebook, the London Underground network and the global ecosystem.

**Convergence and Continuity**
No one can walk infinitely many steps, perform infinitely many additions, or write down infinitely small numbers, but once we understand the definition of a limit in mathematics, the idea of infinity makes sense. The concept of a limit allows us to study whether a given sequence is convergent, or a given function defined on the real numbers is continuous, in a precise way. It also forms the foundations of many of your future mathematics modules.

**Integration and Differentiation**
We take a closer look at differentiation and integration, and the relationship between the two. You will develop a much deeper understanding of calculus and see how to extend the theory to more general settings, as well gain an appreciation of the limitations of the theory through some rather surprising examples.

**Geometry and Calculus**
How would you find the closest point to the origin on a particular curve? What is the tangent plane to a smooth surface and how do we find it? This module begins the study of geometric objects through the use of calculus.

For more information, please visit www.lancaster.ac.uk/maths
Chose your minor

Our flexible Part I system allows you to take one third of your first year modules in another subject area, which you will choose during your first week at Lancaster. Entry onto minor courses is subject to meeting entry requirements and timetabling restrictions.

Minors are a great way to try a second subject at university level, and you may even choose to continue your minor and/or transfer to one of our combined degrees. Some available minor choices include:

- Physics
- Accounting & Finance
- Computer Science
- Mathematics
- Management Science
- French/German/Spanish
- Philosophy
- Chemistry

Other minor choices may be available upon arrival, but are not guaranteed. Minor choices are only available on single honours courses. For example, if you choose to study BA Mathematics and Philosophy, Philosophy is the equivalent of your minor choice.

For more information, please visit www.lancaster.ac.uk/maths
Second year and beyond

Second year
In your second year you will build on the content covered in first year, studying familiar topics. You will be introduced to computational and mathematical problem solving methods including software such as R and LaTeX. Our project skills module will enhance both your subject specific and transferable skills. You will complete both an individual and group project with opportunities to develop your scientific writing, research and presentation skills.

Autumn Term
+ Real Analysis
+ Linear Algebra II
+ Probability II
+ Project Skills

Spring Term
+ Complex Analysis
+ Abstract Algebra
+ Statistics II
+ Computational Mathematics

This allows you to focus on areas of the subject that are of interest to you and where your strengths lie.
You will usually take eight of the following modules:
Pure Mathematics
+ Lebesgue Integration
+ Metric Spaces
+ Hilbert Space
+ Differential Equations
+ Linear Systems
+ Groups and Symmetry
+ Commutative Algebra
+ Algebraic Curves
+ Representation Theory of Finite Groups
+ Graph Theory
+ Combinatorics
+ Geometry of Curves and Surfaces

Probability
+ Probability Theory
+ Stochastic Processes
+ Financial Mathematics

Statistics
+ Likelihood Inference
+ Bayesian Inference
+ Statistical Models

Fourth year
During the fourth year of the MSci course you will be able to choose from a range of specialist modules which link to research interests of academics within the Department. Many advanced third year modules are also available to study. Examples of possible specialist topics include:
+ Assessing Financial Risk
+ Epidemiology
+ Clinical Trials
+ Stochastic Calculus
+ Computer Intensive Methods
+ Galois Theory
+ Longitudinal Data Analysis
+ Operator Theory
+ Topology and Fractals
+ Lie Groups and Lie Algebras

You will also complete an MSci dissertation which can be taken in Statistics, Pure Mathematics or as an industrial project in which you will work in partnership with a company.

Third year
The third year allows great flexibility in terms of module choices. You are able to pick from a range of options across four key areas.

Autumn Term
+ Real Analysis
+ Linear Algebra II
+ Probability II
+ Project Skills

Spring Term
+ Complex Analysis
+ Abstract Algebra
+ Statistics II
+ Computational Mathematics

For more information, please visit www.lancaster.ac.uk/maths
Combined courses

Accounting, Finance and Mathematics
BSc - NG41
BSc (Industry) - NG42
This course will develop your knowledge of advanced mathematical and statistical methods and will provide you with the skills to apply this in a professional context to the fields of accounting and finance.

First year
In the first year you will study the Mathematical Methods module and will take a core module in Principles of Finance and an Introduction to Accounting and Finance. This will introduce you to a wide range of concepts and techniques including financial accounting, managerial finance and financial analysis.

Second year and beyond
In the second year, you will cover probability, statistics, linear algebra and computational mathematics whilst also developing skills in auditing, accounting systems and management accounting. The final year develops your skills in financial accounting and will introduce you to likelihood inference. You will also enhance your employability skills through sector specific careers modules delivered as part of this programme.

Economics and Mathematics
BSc - GL11
BSc (Industry) - GL12
This programme will equip you with mathematical and analytical skills whilst also developing the knowledge and tools to understand the important role of economics in government, business and society.

First year
You will study the Mathematical Methods module and will take a core module in Principles of Economics during which you will be introduced to the principles of economics both at microeconomic and macroeconomic levels. You will also study a careers module through which you will gain an insight into the graduate labour market. We strongly encourage students to take the Mathematical Concepts module too.

Second year And beyond
The second year covers probability, linear algebra, statistics and computational mathematics and you will also be able to choose from a range of modules within economics including Applied Economics, Econometrics and Game Theory. The final year of the course allows you to choose from a wide range of options offered by both departments.

Financial Mathematics
BSc - GN13
BSc (Industry) - GN1J
MSci - GN1H
Our Financial Mathematics programme provides a thorough grounding in finance, computing, quantitative methods and economics. This will give you a wide range of skills and knowledge that employers in the finance sector are looking for.

First year
You will cover the same content as the single honours programme. A third of your time will be spent studying the Introduction to Accounting and Finance module which introduces you to a wide range of concepts and techniques including financial accounting, managerial finance and financial analysis.

Second year and beyond
The second year will cover the topics of probability, statistics and real analysis whilst also developing your understanding of the principles of finance and introducing you to management economics.

Second year and beyond
The second year will cover linear algebra, statistics, business modelling and optimisation. You will also develop knowledge of both micro and macroeconomics. In the final year you will have the flexibility to choose from a range of relevant modules. If you are taking the MSci pathway you will have the opportunity to work on a substantial dissertation in an area of your interest from across the fields of mathematics, statistics, economics and finance.

Mathematics, Operational Research, Statistics and Economics (MORSE)
BSc - GLN0
BSc (Placement year) - GLN1
This course will develop your knowledge of advanced mathematical and statistical methods and will provide you with the skills to apply this in a professional context to the fields of accounting and finance.

First year
In the first year you will study the Mathematical Methods module whilst also being introduced to key topics in other departments: Business Analytics, Principles of Economics and Statistics & Computing for Management.

Second year and beyond
The second year will cover linear algebra, statistics, business modelling and optimisation. You will also develop knowledge of both micro and macroeconomics. The final year will allow you to specialise in areas that suit your interests, choosing modules from across all relevant departments.
Combined Courses

Mathematics and Philosophy

BA - GV15

Studying mathematics and philosophy as a combination will develop your reasoning, logic and analytical skills in both a numerical and non-numerical context. This will prepare you well for a wide range of careers.

First Year

The first year mathematics and statistics content is common to the single honours degrees, however, you will also spend a third of your time studying the first year introduction to philosophy which introduces you to knowledge and reality, critical thinking, political philosophy and ethics.

Second year and beyond

In the second year, you will be required to study real and complex analysis, and both linear and abstract algebra. For the remainder of your second year and your third year, you will be able to choose from a wide range of modules offered by the Department Mathematics & Statistics and the Department of Politics, Philosophy and Religion.

Language Studies and Mathematics

BA French - GR11
BA German - GR12
BA Spanish - GR14

This programme will allow you to study a European language to an advanced level whilst also gaining strong analytical skills. Spending your third year abroad, you will get the chance to put your language skills into practice whilst experiencing a new culture. This programme prepares you well for a range of careers such as in the diplomatic service, civil service and teaching.

First year

You will study the Mathematical Methods module and take a core module in your chosen European language in which you will develop your speaking and writing skills and enhance your cultural knowledge. It is highly recommended that you also study the Mathematical Concepts module.

Second year and beyond

You will be required to take four second year mathematics modules whilst developing your oral and written skills and studying European culture modules. Following your third year abroad, during which you will complete a reflective assignment, the fourth year of the course will further enhance your mathematical and language skills. You will also be able to choose from a wide range of modules covering European culture, mathematics and statistics.

Computer Science and Mathematics

BSc - GG14
MSci - GG1K
BSc (Placement Year) - GG1L

Mathematics underpins technology and so these two subjects create an exciting combination. The computer science component of this degree covers languages and logic, software engineering, communications and systems. The course contains a careful balance of theory and practice which can lead to jobs in all areas of industry.

First year

Covering the common core content of the single honours programmes, you will also be introduced to the fundamentals of computer science and to software development.

Second year and beyond

In the second year, you will complete a group project in computer science and will enhance your knowledge of software design whilst introducing you to Human-Computer Interaction Technology. You will also be required to study linear algebra plus three other subjects from the Department Mathematics & Statistics. The third year allows for more flexibility and you will be required to take four modules in each of the subject areas. Those on the MSci pathway will complete a dissertation in mathematics or statistics or may complete a computer science project. You will also be able to choose from a wide range of specialist modules linked to the research expertise of the two departments.

Theoretical Physics and Mathematics

BSc - F3GC
MSci - F3G1
MSci (Study Abroad) - F3G5

This engaging programme combines pure mathematics with the theoretical concepts of physics. Mathematical models can be used to describe known facts and to be predict new phenomena. The combination of the two subjects creates a challenging and exciting programme of study.

First year

You will study the Mathematical Concepts and Methods modules whilst developing your knowledge of key physics concepts including mechanics, quantum physics, vector calculus, electric and magnetic fields and the thermal properties of matter.

Second year and beyond

Throughout the second and third year you will take a number of compulsory modules which will develop your theoretical knowledge and application skills in both mathematics and physics. In the third year you will undertake both an independent and group project based on an open-ended theoretical physics project. For those on the MSci pathway, you will undertake a Masters project and complete a literature review. This will be on a topic of your choice from a range of options based on departmental research specialisms. You will also take three specialist modules from Physics and two specialist modules from Mathematics.

For more information, please visit www.lancaster.ac.uk/maths
Entry requirements

The A level entry requirements for each of our programmes are listed below. For alternative qualifications and international entry requirements, please contact ugadmissions@lancaster.ac.uk

<table>
<thead>
<tr>
<th>Programme of Study</th>
<th>Including Maths (at Grade A)</th>
<th>Including Maths and Further Maths (at least one at Grade A)</th>
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</thead>
<tbody>
<tr>
<td>BSc/BSc (Placement Year)/MSci/MSci (Study Abroad)</td>
<td>AAA†</td>
<td>AAB†</td>
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<td>+ Mathematics with Statistics</td>
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<tr>
<td>BSc/BSc (Placement Year)/MSci Financial Mathematics</td>
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<tr>
<td>BSc/BSc (Placement Year)/MSci Computer Science and Mathematics</td>
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<td>BA Mathematics and Philosophy</td>
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<tr>
<td>BSc/BSc (Industry) Mathematics, Operational Research, Statistics and Economics (MORSE)</td>
<td>AAB†</td>
<td>AAB†</td>
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<td>BA French Studies and Mathematics</td>
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<td>BA German Studies and Mathematics</td>
<td>AAB</td>
<td>ABB</td>
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<tr>
<td>BA Spanish Studies and Mathematics</td>
<td>(Including language grade B)</td>
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<tr>
<td>BSc/BSc (Industry) Accounting, Finance and Mathematics</td>
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<tr>
<td>BSc/BSc (Industry) Economics and Mathematics</td>
<td>AAB including Maths or Further Maths Grade A</td>
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<tr>
<td>BSc Theoretical Physics with Mathematics</td>
<td>AAB including Maths and Physics at grade A</td>
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<tr>
<td>MSci/MSci (Study Abroad) Theoretical Physics with Mathematics</td>
<td>AAA including Maths and Physics</td>
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</table>

† These offers do not take into account performance in the Test of Mathematics or STEP.

Additional tests

TMUA & STEP†

Whilst not required, we do recognise the value of additional tests you may take and this is reflected in the offers that we make to our applicants.

Test of Maths for University Admission (TMUA)
The Test of Maths for University Admission (TMUA) is set by Cambridge Assessment and is taken in November. The TMUA is designed to test your problem-solving and readiness for university-level mathematics. There are two multiple-choice question papers, each lasting 75 minutes. Results are available at the end of November - you will receive a grade ranging from 1.0 to 9.0. A strong performance of 4.5 or above is very impressive. If you sit the TMUA and perform sufficiently well you will normally receive a lower offer from us. Sitting the test is optional and if you choose not to sit the test, this won’t harm your chances of receiving an offer from us.

Sixth Term Examination Papers (STEP)STEP consists of three papers set by Cambridge Assessment, and are sat in June. They are designed to really test your problem-solving skills. Each paper lasts three hours and contains eleven or twelve relatively long questions, all of which are optional - you answer as many of them as you wish, up to a maximum of six questions. You may enter any combination of the three papers. We value the way that STEP develops advanced problem-solving skills and all our standard offers include an alternative, lower offer that includes a pass (Grade 3) in any STEP. Sitting STEP is optional, and if you choose not to sit STEP, this won’t harm your chances of receiving an offer from us.

If you sit STEP and do not pass, please do not worry - we will treat you exactly the same as if you hadn’t sat STEP at all.

Adjusted offers
If you meet our requirements for TMUA or STEP you will normally receive an alternative offer with a one grade reduction.

Before you receive an offer
If you complete your test before the point of offer, we will take your test result into account at this stage.

After you have received an offer
We will review your offer taking your new test results into account and may amend it to a lower offer.

† Adjusted offers made in light of TMUA or STEP results are only applicable where indicated in the table.

For more information, please visit www.lancaster.ac.uk/maths
Disclaimer

The information provided in this brochure is correct at the time of publication (June 2019) but this may be subject to change as we constantly review and update our degree programmes. This brochure does not guarantee the availability of any module and does not form part of any contract between any person and Lancaster University.