



Mathematics & Statistics
Undergraduate Degrees 2024

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 welcome you into the Department and support your transition to university life. You will be offered regular meetings with tutors and lecturers, and our strong academic support systems are there to ensure you realise your potential. You will study and grow as a person in a vibrant and safe environment, enjoying a wide range of activities, including our very own Maths & Stats Society and our Maths & Stats Hub.

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 stretch you and assist you to develop, and the results will be well worth it.

Come and start your journey with us.

Professor Gordon Blower
Head of Department



Contents

- 04** Our rankings
- 05** For the professional
- 06** A supportive learning environment
- 07** Mathematics Society
- 08** Abbie Wright, loving Lancaster
- 10** Hello future
- 12** A place for Kris Morcom
- 14** Placement year opportunities
- 16** Securing a placement year
- 18** Our programmes
- 19** How you'll learn
- 20** Your first year
- 22** Choose your minor
- 23** Second year and beyond
- 24** A place for Claudia
- 26** Combined courses
- 30** Entry requirements
- 31** Test of Mathematics for University Admission


Come and meet us

Department of Mathematics & Statistics
Lancaster University
Lancaster
LA1 4YF


mathematics@lancaster.ac.uk

lancaster.ac.uk/math

Connect with us

 [@lancsunimaths](https://www.instagram.com/lancsunimaths)

 [@LancsUniMaths](https://twitter.com/LancsUniMaths)

 [@LancasterMathsStats](https://www.facebook.com/LancasterMathsStats)

World-leading research

We are ranked #7 in the UK for research in the 2021 REF.

This means that you will be taught by some of the world's leading researchers in mathematics and statistics.

14th

Lancaster University is ranked 14th in the country for Mathematics

the Complete University Guide 2024

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 & its Applications (IMA) accredit all of our single-honours degree pathways in Mathematics and Mathematics with Statistics.

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. 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.



A supportive learning environment

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.

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.

Academic advisor

When you start at Lancaster you will be assigned an academic advisor, who will (where possible) remain your tutor for the duration of your studies at Lancaster.

This is an academic member of staff who you will meet with once a term in order to check your progress and personal development. Your academic advisor can provide both academic and pastoral advice and you can arrange to meet them at any point if you feel that you would benefit from the additional support.

They can provide extra feedback on coursework, give advice on module choices and discuss potential career options.



Rosie Jones

BA Mathematics & Philosophy graduate 2019-2022

I've really enjoyed my time at Lancaster and my love of maths has only increased since studying here! There's such a wide variety of support available in the Maths & Stats Department, I've always felt there was help available when I needed it.

For more information please visit lancaster.ac.uk/maths

Learning developer

In the Faculty of Science & Technology, we have a dedicated learning developer who can offer tips on finding suitable reading resources and managing your time to achieve your full potential through effective study practices and good scientific writing.

We also offer a Maths and Stats Hub (MASH). This is a tailored and inclusive service, which aims to advance undergraduate students' knowledge and skills, improving their academic performance, confidence and preparedness for the workplace. For more information, please visit www.lancaster.ac.uk/maths-learning-development/.

Transitions team

Settling into university can take time. Here at Lancaster we have a dedicated team who will support you during this transition, and help you make the most of your time at university. For more information, please visit www.lancaster.ac.uk/transitions-team/

College wellbeing officer

Each college has a dedicated wellbeing officer who can provide guidance on welfare and psychological issues, enabling you to better concentrate on your studies. They can help you access support if you are experiencing difficulties with your health, housing, flat mates, personal life, finances or studies.

Lancaster University Mathematics Society



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

MathSoc is a free academic society for anyone to join - if you are looking for a hard-working and supportive community who also know how to have fun, you've found the right place!

We hold social events every week: whether you're into quizzes, board games, and film nights, or bar crawls and poker tournaments, there is something for everyone. Other activities include lectures from guest speakers, which is a great opportunity to expand your interests about different areas of mathematics.

MathSoc also supports students by offering Maths Cafés twice a week, where you can work with peers and access additional support from Academic Officers, whether for coursework support or LaTeX and RStudio help.

We are pleased that the society continues to grow, and we believe it is an incredible extra-curricular activity for you to be a part of.



Joseph Price
**MSc Statistics
2022-2023 and
President of MathSoc**

If anyone is looking for book recommendations, I'd say read as much as possible by George Orwell - the films don't do the story justice compared to the books which will leave you thinking for hours after every chapter - I think 1984 is one of the best in particular.

I've also signed up to be a College Representative for Furness this year, so I'll be looking after incoming students alongside other college staff.

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

One of the great things about Lancaster is that we have regular assessed coursework and workshops which are unbelievably helpful for letting you know how much work to do. If you feel comfortable with most of the questions you are set during the course, you know that you can spend some well-earned relaxation time.

Talking to your peers is another great way to stay on track - it's important not to compare yourself to everyone else too much, but try to make sure that you aren't weeks behind your classmates because it could be very stressful and hard to catch up. This isn't to say that university won't be hard, but if you put the effort in, you will have an amazing time and be hugely rewarded for doing so!

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

I love reading, going to the gym and playing squash. I didn't do any exercise at all in my first year, which I regret, but I fell in love with exercising in second year. Running and weightlifting are both great ways to relieve stress and have some fun. It's also amusing to occasionally see one of the lecturers from the Maths Department go in and outperform most of the other people in the room (although this has only happened once or twice while I was there)! I didn't discover squash until my second year when one of my friends on the same course introduced me to it. She didn't mention she was the captain of the women's team, so it took me quite a while to catch up!

Abbie Wright



BSc Mathematics with Statistics student, Abbie Wright, has secured a graduate role in Financial Modelling with KPMG

For more information please visit lancaster.ac.uk/maths

Loving Lancaster

“

What is your favourite part about studying at Lancaster University?

The community spirit at Lancaster has spurred me on to get involved with so many things and take on opportunities that have made my university experience as amazing as it has been. I have loved studying maths and being able to explore the subject beyond what is taught in school, as well as being surrounded by some incredible minds in the Department, however, this has realistically only been one part of the multi-faceted experience of studying at Lancaster. Meeting new people, networking, discovering new hobbies and skills, volunteering, and working part-time have made up the rest of the experience and made me the person who absolutely loves Lancaster - so I think I'd say my favourite part has been everything!

What do you like to do when you're not studying?

A couple of months after starting university I nominated myself for my college's JCR (the group of elected students who organise/run college events). After being elected, I was responsible for running the college's social media accounts, as well as helping to organise and host events for the college, including welcome week where I hosted a pub quiz to a completely packed out bar of freshers! This experience was a huge confidence booster for me and has left me with amazing memories and lots of stories to impress employers with in applications and interviews. I have also been a member of Lancaster's music society, where I was a member of the brass band and got to travel to Bangor in Wales for the UniBrass competition.

Do you feel the Department has supported you with employability and careers?

The Maths Department has its own dedicated employability staff who are really knowledgeable about the different paths that a degree in maths can lead to, including opportunities in employment and further study. Equally, the careers staff at Lancaster are really phenomenal. I didn't have a clue what kind of career I wanted to go into when I started at university and the support I have received since then has been so useful in helping me to discover what I am passionate about and find the right career to aim for. In my first year, I was given the opportunity to visit a range of graduate employers in Manchester and London with the Careers Service, as well as attending networking evenings with Lancaster alumni who were working in graduate roles in both cities. This led me to secure a place on a summer insight programme with PwC between first and second year.

How has this all prepared you for a future career?

Many of the modules that I've taken have incorporated practical elements including statistical programming and group projects. These experiences have exposed me to the style of work that I am likely to be doing once I join KPMG and have given me a great opportunity to prepare. Outside of my studies I have held part-time jobs as both an ambassador for the Maths Department and for the University as a whole. Both of these roles have been really enjoyable and given me so much more confidence - I've given campus tours to hundreds of prospective students and parents over the years as well as delivered presentations to a full lecture theatre of applicants about studying at Lancaster! I couldn't have imagined doing those things before coming to university, but the opportunities have been incredible, and the University/Department community is so supportive.

Any advice for new students?

Grab the university experience with both hands. I have learned so much about myself and other people during my time at university and I definitely feel like I am coming out of it a more well-rounded individual. Make sure you try something new and don't be afraid to get involved with things that might seem daunting at first. Choosing a mathematics degree at Lancaster has been the best decision I have made in terms of helping me to feel prepared for my future (and having an amazing time).

”

Hello Future

Have you ever wondered where a degree in Maths can take you? The answer is anywhere! As a Maths graduate you will have a unique and transferable skill set sought after by employers across a wide range of sectors who may offer a high starting salary.

You may choose to pursue your love of numbers in a career such as accountancy, finance or banking. Or you may wish to utilise your logic and analytical skills in management roles, consultancy, civil service, education, software or statistics.

Or you could find yourself in developing sectors such as health statistics, data science and software development.

We are committed to developing your employability skills whilst you are here at Lancaster and preparing you for your next step.



Careers support

Our careers tutor 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.

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
- + Game theory
- + Kepler's laws of planetary motion
- + Solving the cubic

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 practise 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.

A place for Kris

BSc Mathematics and Statistics student, Kris Morcom, has secured a graduate job as a programmer for a biostatistics company.

“

I started my Mathematics and Statistics degree back in 2019 and being at Lancaster meant I had all the support I needed during my studies.

Said studies have generally been the perfect balance of fun and challenging. Lecturers are always willing to help, and the weekly workshops help me catch up on anything I've missed. There's a good balance of assignments – quizzes, coursework and the occasional group project to mix things up (not to forget the end-of-year exams!). Between all of these, I feel like my skills are being fairly assessed; there's both academic and more 'real life' work.

Something that really caught my eye when I was applying to Lancaster was the minor offered in first year. As far as I know, there's no real comparable scheme anywhere in the country. You can do something related to your degree, a complementary skill, or something completely different! I personally took a minor in Creative Writing, because I thought that the opportunity was so good, I couldn't pass it up. Meanwhile, one of my friends took a minor in German – he liked it so much he changed his degree to be a joint major in both Maths and German.

Another of Lancaster's stand-out points is its collegiate system. The idea of having a smaller community within the University itself really appealed to me. Being able to make friends from other courses and years meant I could meet a much more diverse group of students. And of course, having 8 different bars and common rooms on campus is a huge plus! Each has its own character and being able to study with friends over a meal in County before going for a round of drinks and a game of pool in Grizedale is great.

I'll look back fondly on my years here. The careers scheme has helped me to land a job as a programmer at a biostatistics company in London. I really look forward to using what I've learnt here, and I'll be proud to say that I'm an alumnus of Lancaster University!

”

Kris Morcom



BSc Mathematics and Statistics student, Kris Morcom

Placement Year opportunities

Our Placement degrees provide the opportunity to spend a year working in industry. You can gain valuable experience which gives you a strong advantage in the job market, and often helps you to decide which career path you would like to take.

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.

Our students have taken up placements with a range of organisations including IBM, KPMG, the NHS and governments within the UK.

Here, two of our students reflect on their year working in industry.



Rhys Peplow
BSc Mathematics with Statistics
(Placement Year)
MSc Data Science

I've been at Lancaster for 5 years doing my Bachelors degree in Mathematics with Statistics (with Placement Year) and a Master's in Data Science, which has equipped me with the tools to feel confident going into graduate roles after university. The undergraduate course is broad to allow you to gain vital skills in a number of areas while being detailed enough in order to understand and be able to reproduce those abilities to a high standard; it gave me the framework to allow me to pursue the Master's and specialise in a topic that I'm really passionate about.

I spent 13 months with IBM as a financial analyst. During this time, I was responsible for managing projects and budgets as well as a number of ad-hoc tasks which allowed me to experience various roles, not just what was on the job description. Before placement, I had no clue what job I wanted to pursue, the year gave me plenty of chances to try out various roles and find out what I do (and definitely do not) want to do, so the flexibility has allowed me to mould a career path and lead me to choose to study the MSc Data Science. Training is provided from our Faculty in the first two years and then ongoing support throughout the industry year means you are never far from help if you need it; the team was vital in my search for a placement!

Both of my degrees have constantly challenged me to be more inquisitive about maths, and our world-leading researchers teach modules on their fields, so you get the very best to learn from. Utilising the software R has been fascinating and the applications are endless; knowledge of this program makes picking up new ones so much easier too.

For more information please visit lancaster.ac.uk/maths



Cerys Evans
BSc Mathematics
(Placement Year)

Why Lancaster?

Lancaster has been the perfect place for me. The campus feels like its own little world and the sense of community has been a really key part of my experience at Lancaster. You can find your place in colleges, liberation forums, and societies – there really is somewhere for everyone.

Tell us about your course

The way that the Mathematics course is structured at Lancaster means that by the end of first year every student is caught up to the same level so you don't have to worry about being behind if you studied different qualifications at school. Then second year builds on that foundation to give a breadth of teaching across pure maths, statistics, and mathematical methods so that you can study what interests you in third year knowing that you have a strong basis to work from.

What do you do when you're not studying?

My favourite part about my time in Lancaster has been everything I've been involved with outside of my course. Throughout my second year I got more involved with my department and the Students' Union. I was the lead student

ambassador for the Mathematics and Statistics Department in 2020/21 and 2022/2023 and this was a fantastic opportunity to develop my management and engagement skills while helping others on my course to study better. There are so many fantastic opportunities for growth at Lancaster and since starting at university I've significantly developed both professionally and personally thanks to getting involved with things on campus.

Tell us about your placement year

I spent 14 months working for NHS England as a data analyst in the performance analysis team. I had the opportunity to work on official statistics that were discussed on the news and used by Number 10, the CEO of the NHS, and the general public. I was able to use the coding skills I learned in my degree to improve processes within my team which significantly increased efficiency and reduced errors.

I absolutely loved working in a sector that I feel passionately about and now know that data is the career I want to work in after I graduate. My placement experience helped me choose third-year modules that will be relevant to the graduate jobs I plan to apply for and the assessments I did during my placement year have helped me reflect on what sort of jobs I want to apply for.

Securing a Placement Year

Ellen has completed the first two years of her degree and will be taking up a placement opportunity for GlaxoSmithKline throughout her third year. Find out how she secured her placement and utilised the services available to her.

“

At A levels I studied Maths, Further Maths and Chemistry but I was always really focused on doing a Maths degree. Coming to Lancaster I thought I wanted to study pure mathematics but after the first year I decided that I wanted to change to mathematics and statistics. This change was quite easy to make as Lancaster allows us some flexibility with our degree schemes. The course is designed so that you can get what you want out of your degree, and I am happy I could change when I wanted.

In my third year, I will be going on a Placement Year. I will be joining GlaxoSmithKline (GSK) to go into the Supply Chain team based at Barnard Castle. During my 12 months placement I will gain paid work experience in a business environment before returning to finish my degree the year after. For me, it was an opportunity to see what the working world is like and help me decide what I would like to do after university.

The placement is something I had to set up myself with the support from the University. In my first year I was given workshops on how to write a CV, cover letter and how to apply for placements. Then in my second year

I started applying for placements, taking part in interviews and attending assessment centres. I was offered a number of interviews and placements and made the decision to accept GSK's offer in the second term of my second year.

As with anything new, addressing the challenges is always a bit daunting. However, I learned rather the best way was to ask people for help and advice and use the tools and support provided by the University. Whilst I am looking forward to my year away, it will be great to be back in Lancaster to finish my degree.

”

Ellen
Sayles



BSc Mathematics (Placement Year)

Our programmes

We offer degrees in Mathematics, Mathematics with 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.

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.



How you'll learn

Lectures

Lectures will introduce you to course content. During your first year, you will typically have four of these per week in each mathematics and statistics 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.

Workshops

Our regular workshops will guide you throughout your studies by providing expert 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.

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 programming skills and enhance your employability.

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.

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.

MATH100 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, for example, electrical engineering.

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 scientific problems 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.



MATH110 Mathematical Concepts

Numbers and Relations

Is it possible to write 84503 as a sum of the squares of two whole numbers? What is the largest whole number that exactly divides both 99457 and 75067? This module will show you how to answer these and similar questions. You will also encounter formal logic and learn about mathematical proofs.

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.

Series, Differentiation and Integration

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.

Choose your **minor**

Mathematical
Methods

+

Mathematical
Concepts

+

Minor Subject

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
Economics
Philosophy
Computer Science
Management Science
French/German/Spanish/Chinese/Italian
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.



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 and will learn how to use the programming language R and the type-setting language 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

Third year

The third year allows great flexibility in terms of module choices. You are able to pick from a range of options across five key areas. 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 modules from a wide variety of options, including:

Algebra and Geometry

+ Groups and Symmetry
+ Number Theory
+ Commutative Algebra
+ Algebraic Curves
+ Representation Theory
+ Geometry of Curves and Surfaces
+ Graph Theory
+ Combinatorics

Analysis

+ Lebesgue Integration
+ Metric Spaces
+ Hilbert Space
+ Differential Equations
+ Linear Systems

Probability

+ Probability Theory
+ Stochastic Processes
+ Mathematics for Stochastic Finance

Statistics

+ Likelihood Inference
+ Bayesian Inference
+ Statistical Models
+ Time Series Analysis
+ Medical Statistics
+ Multivariate Statistics in Machine Learning

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:

+ Principles of Epidemiology
+ Clinical Trials
+ Stochastic Calculus for Finance
+ Computer Intensive Methods
+ Extreme Value Theory
+ Galois Theory
+ Longitudinal Data Analysis
+ Operator Theory
+ Lie Theory
+ Topology and Fractals

You will also complete an MSci dissertation which can be taken in Statistics or Pure Mathematics.

Andra Claudia Stefan



BSc Mathematics

For more information please visit lancaster.ac.uk/maths

“

A place for Claudia

Claudia grew up in Romania and chose Lancaster to study her degree in Mathematics.

I am a third year Mathematics undergraduate. I have been passionate about mathematics since primary school. I was fascinated by geometry especially because we can find its principles everywhere around us. For example, the way bees build their hive in a hexagonal shape, or how Fibonacci numbers appear in snail shells.

Studying Mathematics at Lancaster University was a great decision. I feel like the Maths and Stats Department provides the space and opportunity to sharpen the students' skills and grow with support available for everybody. In my first academic year, I realised the importance of statistics and maths in the real world. After graduation, I would like to build my career in research applying the methods I have learnt.

One thing that made me choose Lancaster University was the campus, especially the variety of places where you can have a picnic with friends or enjoy outdoor sports. Moreover, Lancaster University is famous for its social life. With 9 colleges, you have plenty of opportunities to make friends and take part in various activities and competitions between the colleges or the legendary Roses competition between Lancaster and York universities. Being an international student, I can say that Lancaster University became my second home. As I enjoy studying Maths at Lancaster University, I decided to become a Maths Ambassador to engage more with the Department and fellow students.

Although studying Mathematics can be very challenging at times, I believe that the rational mind and hard work I have developed during my studies will always help me to solve any problems in my life.

”

Computer Science and Mathematics

BSc - GG14

BSc (Placement Year) - GG1L

MSci - GG1K

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 will prepare you well for graduate-level jobs in 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 of Mathematics and 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.



Data Science

BSc - G900

BSc (Placement Year) - G901

BSc (Study Abroad) - G902

MSci (with Industrial Experience) - G903

Data science plays a vital role in all aspects of the modern world. This course will ensure you have a strong foundation in this rapidly expanding, highly in-demand field. You will gain cutting-edge knowledge and skills through state-of-the-art equipment and excellent teaching offered by leading academics in both the Department of Mathematics and Statistics and the School of Computing and Communications.

First year

In your first year, you will receive a comprehensive grounding in the theory and practical skills of computer science and gain an understanding of mathematical methods and concepts. You will also enhance your data analysis, problem-solving and quantitative reasoning skills.

Second year and beyond

In the second and third year, you will learn the significant contemporary developments in research, practice, and technology. This means you will further deepen your knowledge in linear algebra, probability and statistics, as well as computer science modules in our Software and Data and Algorithms themes.

In the final year you will have the opportunity to specialise in a range of enriching research-informed optional modules, as well as undertaking a substantial data science individual project.



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 whilst also taking one module in Principles of Economics 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 mathematical content of the second year includes probability, linear algebra, statistics and computational mathematics. In Economics, you will be able to choose from a range of topics, such as Micro- and Macroeconomics (providing an essential foundation for final year modules), Econometrics, Applied Economics and Game Theory. The final year of the course allows you to choose from a range of options offered by both departments.

Financial Mathematics

BSc - GN13

BSc (Placement Year) - GN1J

MSci - GN1H

Our Financial Mathematics programme provides a thorough grounding in mathematics & statistics, finance, 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 study the same Mathematics & Statistics modules as the single honours programme, that is, Mathematical Methods and Mathematical Concepts.

In the remainder of your time, you will study "Introduction to Accounting and Finance", where you will encounter a wide range of concepts and techniques from 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.

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.

Language Studies and Mathematics

BA French - GR11

BA German - GR12

BA Spanish - GR14

BA Chinese - T1G1

These programmes will allow you to study a modern 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 modern 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 culture modules relating to your target language country(ies). 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 the culture(s) of the target language country(ies) as well as mathematics and statistics.

Mathematics, Operational Research, Statistics and Economics (MORSE)

BSc - GLN0

BSc (Industry) - 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 business modelling, analytics and decision support.

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 and Principles of 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. The final year will allow you to specialise in areas that suit your interests, choosing modules from across all relevant departments.

Mathematics and Philosophy

BA - GV15

BA (Placement Year) - GV16

Studying mathematics and philosophy as a combination will develop your reasoning, logic and analytical skills in both a numerical and verbal 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 study the core components of the mathematics syllabus in analysis and algebra, supplemented by some optional modules in Philosophy, including Values and Objectivity, Metaphysics and Philosophy of Science. In your third year you will be able to choose from a wide range.

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 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 (excluding Study Abroad students, who spend this year overseas).

For those on the MSci pathway, you will undertake a Master's 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.

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

Programme of Study	Including Maths (at Grade A)	Including Maths and Further Maths (at least one at Grade A)
MSci/MSci (Study Abroad) + Mathematics + Mathematics with Statistics MSci Financial Mathematics MSci Computer Science and Mathematics	A*AA	AAA
BSc/BSc (Placement Year) + Mathematics + Mathematics with Statistics BSc/BSc (Placement Year) Financial Mathematics BSc/BSc (Placement Year) Computer Science and Mathematics BA/BA (Placement Year) Mathematics and Philosophy BSc/BSc (Industry) Mathematics, Operational Research, Statistics and Economics (MORSE)	AAA	AAB
BA French Studies and Mathematics BA German Studies and Mathematics BA Spanish Studies and Mathematics BA Chinese Studies and Mathematics	AAB (Including language grade B and Maths or Further Maths grade A)	ABB (Including language grade B and Maths or Further Maths grade A)
BSc/BSc (Industry) Accounting, Finance and Mathematics BSc/BSc (Industry) Economics and Mathematics	AAB (including Maths or Further Maths grade A)	
BSc Theoretical Physics with Mathematics MSci/MSci (Study Abroad) Theoretical Physics with Mathematics	AAA (including Maths and Physics grade A)	
BSc Data Science	AAB (including Maths or Further Maths grade A)	
BSc (Placement Year) / BSc (Study Abroad) / MSci (with Industrial Experience) Data Science	AAA (including Maths or Further Maths grade A)	

For more information please visit lancaster.ac.uk/maths

Additional test TMUA

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 Mathematics for University Admission (TMUA)

The Test of Maths for University Admission (TMUA) is set by Cambridge Assessment and sat 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 in the TMUA is very impressive. If you sit the TMUA and choose to share your scores with

us, we will take these into account as part of your application as a whole. For example, we might take a strong TMUA score into account if you narrowly miss the published entry grades.

In general, taking TMUA is good preparation for studying mathematics at university level.



Department of Mathematics and Statistics
Lancaster University, Lancaster,
LA1 4YB United Kingdom

E: mathematics@lancaster.ac.uk

lancaster.ac.uk/maths



Printed on FSC paper
using vegetable based inks



Disclaimer

The information provided in this brochure relates primarily to 2024/25 entry to the University and every effort has been taken to ensure the information is correct at the time of printing in June 2023. The University will use all reasonable effort to deliver the course as described but the University reserves the right to make changes after going to print. You are advised to consult our website at www.lancaster.ac.uk/study for up-to-date information before you submit your application. Further legal information may be found at www.lancaster.ac.uk/compliance/legalnotice.