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 realise that you may have faced many challenges with your education over the past year and more, and you can be assured that 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 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 in many cases. 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.

Prof Alexander Belton
Head of Department

Come and meet us
Department of Mathematics & Statistics
Lancaster University
Lancaster
LA1 4YF
mathematics@lancaster.ac.uk
www.lancaster.ac.uk/maths

Connect with us
@lancsvimaths
@LancsUnMaths
@LancasterMathsStats
World ranked

Top 250 for Mathematics and top 100 for Operational Research in the 2021 QS World University 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 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. 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
How you’ll learn

Lectures
Lectures will introduce you to course content. During your first year, you will 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.

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
After a disruptive time in your education, 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.

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.

A place for Rhys

Rhys Peploe, BSc Mathematics with Statistics (Placement Year)

When did you know Lancaster was the right place for you?
I knew Lancaster was the one during an Offer Holder Event. All the staff and students were so excited to show off the campus - it was clear to see their passion for maths and Lancaster! I distinctly remember the MathSoc president talking to me about studying here, everything she said made me more certain that this was the place to be.

Inspired by this, I took the first opportunity to become a Maths Ambassador in first year.

What do you like about campus universities?
One of the unique points about Lancaster is the collegiate system. When you arrive, you are inducted into one of our 8 undergraduate colleges and from then on, you will always have a community with you every step of the way and an unwavishable loyalty - your college will always be the best! County College has provided fantastic events and amazing opportunities for me to meet people who’ve become some of my closest friends.

Favourite part of your course?
My third-year modules have been so fascinating; given the freedom to pick which topics to do more of, I selected a lot of statistics and discovered some insane applications to real life which makes me love the subject even more.

What has surprised you most about Lancaster?
Lancashire is such a beautiful area to live in! One of my best memories was listening to the Ashes on the memorial hill at Williamson Park with my flat mate, despite neither of us knowing anything about cricket! Up there you get a great view of the river Lune which flows through the city and has an amazing path alongside it - I love running down there, it is so picturesque.

What was your placement year experience like?
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 these options without being tied to one department, so the flexibility has allowed me to mould a career path.

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!

Describe the difference between each year?
The aim of first year is to get everyone to a similar level. Having laid the foundations in the first year, the second starts to stretch these subjects and takes it to the next level. At Lancaster the first two years have fixed modules, so that you gain an appreciation and strong knowledge in most topics, which also does not cut of any modules for you in third year. This structure means you get world class pure maths and stats teaching.

My transition from placement back to final year was the easiest year to year move I’ve made. A combination of the professionalism that I acquired, with the experience of what I did well (and not too well) in previous years meant I could hit the ground running. With a complete choice for modules in third year, you can mould the degree to your preferences.

How have you found living away from home and making new friends?
Moving to a new city feels like the most exciting and daunting thing you’ve experienced so far, that is absolutely normal. Those nerves get put to bed very quickly though once you start meeting your flat mates and the rest of your college, you are all in the same boat so I tried to get involved as much as I could and met some incredible people along the way. I’ve been a part of the Rugby Union team and the Student Scout and Guide Organisation, both have given me caring communities to grow in and have helped me develop over the last few years. With around 200 clubs and societies on offer, you can start something new or continue with a hobby you love!

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

When you start at Lancaster you will be assigned an academic tutor, 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 tutor 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.

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

Setting 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.

A supportive learning environment

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

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!

They 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 Cafes twice a week, where students 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 students to be a part of.

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

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Joseph Price

Third year MSci Mathematics student and President of MathSoc

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!

“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.”

Rosie Jones

Second Year, Furness College
BA Mathematics and Philosophy

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

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

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).

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

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

A world for Ben

Ben Webb, MSci Mathematics with Statistics (Study Abroad), spent an eventful third year studying in Canada.

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.

The ones of skiing and dogs are in a place called Haliburton. Western ran a club called the Outdoors Club, and we stayed overnight in Haliburton.

The rest are shots from about campus – capturing a year I’ll never forget.
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 Academic Employability Champion 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

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
Throughout all aspects of my university life I felt very well supported. Within the colleges there were Senior Common Room staff (SCR) and Junior Common Room Exec (JCR); they can help with any issues from flat/accommodation problems to welfare. Within the Department, you are given an academic advisor, who is also a lecturer, when you start. They were there to make sure that we were coping and keeping up with our studies, they could act as referees, and really help point us in the right direction. The Maths & Stats Department also has a Careers Member who can point out graduate opportunities and internships, and arranges CV and interview workshops within our degree. In addition to all of this, there’s also the Base, where you can find part-time work on campus, internships, graduate jobs, aid in CV writing, financial issues, and even interview techniques. All of the support you could ever really need during your degree is at your fingertips.

Lancaster provided me with lots of opportunities to put my skills to practice. Outside of lectures, I attended workshops with PhD students in which I felt more comfortable in asking questions. There were also labs to apply what was taught programmatically to really broaden the depth of understanding. Second and third year contained a lot of project work; looking at LaTeX and RStudio. All of the skills that I developed in these workshops and labs, as well as the programming languages, are things that I use daily in my current job.

During my 3rd year, I really enjoyed being able to choose all of my own modules. I was always drawn to statistics and was able to focus upon this in my final year. It was this year that I discovered Medical Statistics, and it was ultimately this module that heavily influenced my Masters and future career. I stayed at Lancaster to do a Masters in Statistics as I was able to explore my interest in the area of Medical Statistics. Since completing my studies, I now work for AstraZeneca as a Statistician within Oncology, and have relocated to Cambridge.

For more information, please visit [www.lancaster.ac.uk/maths](http://www.lancaster.ac.uk/maths)
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.

A place for Jacqueline

I have always dreamed of studying abroad; meeting new people and learning different cultures. UK is one of the top choices for international students, it has high standards, and degrees from UK higher education providers are respected all around the world. I was attracted to Lancaster because of its beautiful campus and lovely city.

Lancaster University has a flexible course scheme. The main reason I chose to study here is because they offered the joint degree I wanted to take. I chose Computer Science and Mathematics because they are much needed in the future and the two subjects complement each other. The skills I learned from my maths modules were transferable to my computer science modules, and vice versa.

I really enjoyed the interactive teachings, namely the workshop and lab sessions. The labs are fully equipped, which motivated me and helped increase my productivity. During these classes, I was able to seek help one-on-one with a tutor or a lecturer. I look forward to applying all the skills (both technical and non-technical) I acquired during my time at Lancaster University to my future career.

Jacqueline Leonardo, BSc Computer Science and Mathematics, grew up in Indonesia and felt at home straight away because of the beautiful campus and lovely city.

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

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 proof.

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.

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.

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.

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
Choose 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
- 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.

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

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.

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

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 the following:

Algebra and Geometry
- Groups and Symmetry
- Number Theory
- Commutative Algebra
- Topics in Algebraic Number Theory/Algebraic Geometry
- Representation Theory
- Topology
- Geometry of Curves and Surfaces
- Graph Theory
- Combinatorics

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
- Infinite-Dimensional Analysis
- Lie Theory

You will also complete an MSci dissertation which can be taken in Statistics or Pure 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 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 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. 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 (Industry) - GLN1_

This course will develop your knowledge of advanced mathematical and statistical methods and 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.
**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 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 of modules in either discipline.

### Language Studies and Mathematics

**BA French - GR11**

**BA German - GR12**

**BA Spanish - GR14**

**BA Chinese - T1G1**

This programme 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.

### 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 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 of 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 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; please see pp 12-13 for information about Study Abroad).

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

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 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 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 two 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 two 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.

‡ These offers may be further reduced depending on your performance in the Test of Mathematics or STEP.

† 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 relates primarily to 2022/23 entry to the University and every effort has been taken to ensure the information is correct at the time of printing in June 2021. 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.