UNIVERSITY OF LIVERPOOL

Courses may close earlier than the advertised application deadline if the course is full.
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BSc (Hons)

Applied Mathematics

UCAS code G121

Entry requirements	Study mode	Duration	
A level: ABB	Full-time	3 years	Apply by: **30 June 2026** Starts on: **28 September 2026**

About this course

Applied Mathematics at the University of Liverpool will teach you how to think differently about the world around us. You will engage with powerful mathematical concepts that will enhance your problem-solving and critical thinking skills, enabling you to understand complex phenomena across all aspects of the modern world, from physics to engineering, computer science, epidemiology, AI, and machine learning.

Introduction

Not only is Mathematics a fascinating, beautiful and diverse subject to study, but it also forms the foundation of all modern science. The concepts, methods, and philosophy of Mathematics is critical to understanding the world around us – whether that be climate change, epidemics, financial markets, or unravelling the mysteries of the universe.

Applied Mathematics degree from the University of Liverpool offers a powerful blend of theory and real-world problem solving, preparing you for a wide range of exciting careers. Whether you're interested in biology, engineering, finance, data science, environmental modelling, computer science, healthcare, or physics, this degree equips you with the mathematical tools and computational skills to tackle complex challenges. You'll learn how to analyse data, optimize systems, and build models to predict outcomes in a diverse range of fields.

With a strong emphasis on practical applications, an Applied Mathematics degree opens doors to jobs that are in high demand and gives you the flexibility to innovate and make an impact in nearly every industry. Plus, the problem-solving abilities you develop will be invaluable no matter where your career takes you!

You will be taught in a friendly, supportive environment by exceptionally qualified staff, who have first-class reputations in teaching and research, covering a wide range of applications across all areas of science.

This programme also has the options of undertaking a year abroad and a year in industry.

What you'll learn

• The fundamental concepts in the core areas of mathematics including analysis, linear algebra, differential equations and statistics.
• How to think differently, reason clearly and critically, and to construct mathematical arguments.
• How to analyse a mathematical problem and select appropriate tools to solve it.
• How to construct and assess mathematical models for real-world problems and use these models to offer unique insights.
• How to communicate and present mathematical information and ideas clearly, both to specialists and non-specialist audiences – an essential skill in any future career.

Back to top

Course content

Discover what you'll learn, what you'll study, and how you'll be taught and assessed.

Year one

In year one you will study eight compulsory modules, to learn the fundamentals of a range of mathematical topics

Modules

Compulsory modules	Credits
CALCULUS I (MATH101)	15
INTRODUCTION TO LINEAR ALGEBRA (MATH103)	15
INTRODUCTION TO STUDY AND RESEARCH IN MATHEMATICS (MATH107)	15
MATHEMATICAL IT SKILLS (MATH111)	15
CALCULUS II (MATH102)	15
INTRODUCTION TO STATISTICS USING R (MATH163)	15
NEWTONIAN MECHANICS (MATH122)	15
NUMBERS, GROUPS AND CODES (MATH142)	15

Programme details and modules listed are illustrative only and subject to change. As part of our commitment to continuous improvement, we are currently reviewing all of our programmes. This may include refining study pathways, strengthening links with employers, integrating generative AI, developing students' research skills, and enhancing

alignment with our research strengths. The course content currently shown on this page reflects the programme as it is running in September 2026. This page will be updated for students beginning in September 2027 by 1 September 2026 at the latest.

Year two

In year two you will continue to study a range of important mathematical topics in more depth. You will study some compulsory, and choose some optional, modules from the list below. Please note that we regularly review our teaching, so the choice of modules may change.

For students who did not study at XJTLU, modules MATH244 and MATH221 are compulsory, module MATH242 is optional, module MATH241 is not available. For students who did study at XJTLU, module MATH241 is compulsory, modules MATH244, MATH221 and MATH242 are not available.

Modules

Compulsory modules	Credits
VECTOR CALCULUS WITH APPLICATIONS IN FLUID MECHANICS (MATH225)	15
COMPLEX FUNCTIONS (MATH243)	15
LINEAR ALGEBRA AND GEOMETRY (MATH244)	15
STATISTICS AND PROBABILITY I (MATH253)	15
DIFFERENTIAL EQUATIONS (MATH221)	15
CLASSICAL MECHANICS (MATH228)	15
NUMERICAL METHODS (MATH226)	15
METRIC SPACES AND CALCULUS (MATH241)	15

Optional modules	Credits
METRIC SPACES AND CALCULUS (MATH242)	15
COMMUTATIVE ALGEBRA (MATH247)	15
STATISTICS AND PROBABILITY II (MATH254)	15
FINANCIAL MATHEMATICS (MATH260)	15
OPERATIONAL RESEARCH: LINEAR AND CONVEX METHODS (MATH269)	15
STEM EDUCATION AND COMMUNICATION (MATH291)	15

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Year three

In year three, you will study five compulsory modules and choose three of the optional modules available. Please note that we regularly review our teaching, so the choice of modules may change.

Modules

Compulsory modules	Credits
FURTHER METHODS OF APPLIED MATHEMATICS (MATH323)	15

Compulsory modules	Credits
CARTESIAN TENSORS AND MATHEMATICAL MODELS OF SOLIDS AND VISCOUS FLUIDS (MATH324)	15
NUMERICAL METHODS FOR ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (MATH336)	15
MATHEMATICS OF NETWORKS AND EPIDEMICS (MATH338)	15
MATHEMATICAL BIOLOGY (MATH335)	15

Optional modules	Credits
QUANTUM MECHANICS (MATH325)	15
RELATIVITY (MATH326)	15
NUMBER THEORY (MATH342)	15
GROUP THEORY (MATH343)	15
DIFFERENTIAL GEOMETRY (MATH349)	15
LINEAR STATISTICAL MODELS (MATH363)	15
PROFESSIONAL PROJECTS AND EMPLOYABILITY IN MATHEMATICS (MATH390)	15
MATHS SUMMER INDUSTRIAL RESEARCH PROJECT (MATH391)	15
GAME THEORY (MATH331)	15
COMBINATORICS (MATH344)	15

Optional modules	Credits
THE MAGIC OF COMPLEX NUMBERS: COMPLEX DYNAMICS, CHAOS AND THE MANDELBROT SET (MATH345)	15
TOPOLOGY (MATH346)	15
THEORY OF STATISTICAL INFERENCE (MATH361)	15
MEDICAL STATISTICS (MATH364)	15
MEASURE THEORY AND PROBABILITY (MATH365)	15
MATHEMATICAL RISK THEORY (MATH366)	15
NETWORKS IN THEORY AND PRACTICE (MATH367)	15
MORE IS DIFFERENT: STATISTICAL MECHANICS, THERMODYNAMICS, AND ALL THAT (MATH327)	15
MATHEMATICS INTERNSHIP (MATH309)	15

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Teaching and assessment

How you'll learn

You'll be taught through a diverse blend of engaging teaching methods, including lectures, tutorials, practical classes, video content, interactive learning sessions, independent study,

and supervised project work.

The Department of Mathematical Sciences offers a vibrant, stimulating, and supportive learning environment with highly motivated and exceptionally qualified staff, renowned for their world-leading research and teaching.

In year 1, lectures are supplemented by a thorough system of small-group tutorials; computing work is carried out in supervised practical classes. Key study skills, presentation skills and group work start in the first year and are developed later in the programme. The emphasis in most modules is on the development of problem-solving and critical thinking skills, which are regarded very highly by employers.

How you're assessed

Each module has an assessment scheme tailored to fit its syllabus. This might include traditional written exams, class tests, assignments, projects, group work, or online exercises with automatic marking and immediate feedback.

Liverpool Learning Framework

At Liverpool, we take a distinctive approach to education through the Liverpool Learning Framework. This means teaching that is engaging, inclusive and designed to help you succeed during your studies and beyond.

You'll develop specialist subject knowledge alongside the skills employers value most, including:

- Digital fluency
- Confidence
- Global citizenship

Our curriculum is characterised by the three Liverpool Hallmarks:

- Research-connected teaching - learning informed by the latest ideas and discoveries
- Active learning - taking part, applying knowledge and learning by doing
- Authentic assessment - assessments designed around real-world tasks and challenges

We also embed key priorities across our curriculum, including AI literacy, employability, and sustainability, helping you prepare for the future and make a positive impact in the world.

We're committed to creating a supportive and inclusive learning environment where every student can thrive.

Back to top

Careers and employability

A degree in applied mathematics provides access to an almost limitless range of rewarding career paths. As a graduate with an applied mathematics degree from the University of Liverpool, you'll have an extremely valuable set of analytical and critical thinking skills that employers value, enabling you to pursue careers in almost any field.

Graduates with a mathematics-based degree are in high demand across a broad spectrum of industries, thanks to their expertise in quantitative analysis, problem-solving, and mathematical modelling. Some of the key career paths include:

- Data Science and Analytics: Mathematics graduates are well-equipped to work as data scientists, data analysts, or business analysts. Their skills in statistical modelling, machine learning, and data interpretation are highly sought after in sectors like finance, healthcare, and tech
- Engineering and Technology: Mathematics graduates can work in engineering roles, including systems engineering, computational modelling, and simulation. They may also contribute to software development, particularly in fields that require complex algorithms, like AI and cybersecurity
- Operations Research and Logistics: Companies in manufacturing, transportation, and supply chain management often hire mathematics graduates to optimize processes, improve efficiency, and reduce costs. Roles include operations research analyst, supply chain planner, and logistics coordinator
- Healthcare and Biostatistics: Mathematics is increasingly used in medical research, epidemiology, and healthcare analytics. Careers may include biostatistician, health data analyst, or mathematical modeller in disease forecasting.

The versatility of a mathematics-based degree allows graduates to enter nearly any sector that requires mathematical modelling, statistical analysis, and algorithmic problem-solving. The growing demand for data-driven decision making in today's world ensures that career prospects remain strong, with opportunities for advancement and specialization across fields.

Back to top

Fees and funding

Your tuition fees, funding your studies, and other costs to consider.

Tuition fees

UK fees (applies to Channel Islands, Isle of Man and Republic of Ireland)

Full-time place, per year - £9,790
Year in industry fee - £1,955
Year abroad fee - £1,465 (applies to year in China)

International fees

Full-time place, per year - £29,500
Year in industry fee - £1,955
Year abroad fee - £14,750 (applies to year in China)

The fees shown are for the academic year 2026/27. Please be advised that tuition fees may increase each year for both UK and international students. For UK students, this will be subject to the government's regulated fee limits.

Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support. Learn more about paying for your studies.

Additional costs

Your tuition fee covers almost everything but you may have additional study costs to consider, such as books.

Find out more about the additional study costs that may apply to this course.

Back to top

Entry requirements

The qualifications and exam results you'll need to apply for this course.

A levels

ABB
including Mathematics A level grade A.

Applicants with the Extended Project Qualification (EPQ) are eligible for a reduction in grade requirements. For this course, the offer is **ABC** from A levels, with **A** in the EPQ.

If you don't meet the entry requirements, you may be able to complete a foundation year which would allow you to progress to this course.

Available foundation years:

- Mathematical Sciences BSc (Hons) (Foundation, 4 year route with Carmel College) BSc (Hons)

T levels

T levels are not currently accepted.

GCSE

4/C in English and 4/C in Mathematics

Subject requirements

Applicants must have studied Mathematics at Level 3 within 2 years of the start date of their course.

For applicants from England: For science A levels that include the separately graded practical endorsement, a "Pass" is required.

BTEC Level 3 National Extended Diploma

D*DD in relevant diploma, when combined with A Level Mathematics grade A.

International Baccalaureate

32 points overall with no score less than 4 and including 6 in HL Mathematics, or pass the IB Diploma plus 6,5,5 in 3 HL subjects including 6 in HL Mathematics.

Irish Leaving Certificate

H1, H2, H2, H2, H3, H3 including Mathematics at H1.

Scottish Higher/Advanced Higher

Advanced Highers accepted at grades ABB including grade A in Mathematics.

Welsh Baccalaureate Advanced

B in the Welsh Baccalaureate, plus grades AB at A level to include Mathematics at grade A.

Access

Pass Access Diploma in a relevant subject with 45 Level 3 credits, with 33 at Distinction (including 15 in Mathematics) and 12 at Merit.

International qualifications

Select your country or region to view specific entry requirements.

If you hold a bachelor's degree or equivalent, but don't meet our entry requirements, you could be eligible for a Pre-Master's course. This is offered on campus at the University of Liverpool International College, in partnership with Kaplan International Pathways. It's a specialist preparation course for postgraduate study, and when you pass the Pre-Master's at the required level with good attendance, you're guaranteed entry to a University of Liverpool master's degree.

Alternative entry requirements

- If your qualification isn't listed here, or you're taking a combination of qualifications, contact us for advice
- Applications from mature students are welcome.

English language requirements

You'll need to demonstrate competence in the use of English language, unless you're from a majority English speaking country.

We accept a variety of international language tests and country-specific qualifications.

International applicants who do not meet the minimum required standard of English language can complete one of our Pre-Sessional English courses to achieve the required level.

IELTS

6.0 overall, with no component below 5.5

TOEFL iBT

If you took a TOEFL test on or before 20 January 2026, you'll need 78 overall, with minimum scores of listening 17, writing 17, reading 17 and speaking 19. If you took a TOEFL test from 21 January 2026 onwards, when a new scoring system was introduced, you'll need 4 overall, with 4 or above in all components. TOEFL Home Edition not accepted.

Duolingo English Test

115 overall, with speaking, reading and writing not less than 105, and listening not below 100

Pearson PTE Academic

59 overall, with no component below 59

LanguageCert Academic

65 overall, with no skill below 60

Cambridge IGCSE First Language English 0500

Grade C overall, with a minimum of grade 2 in speaking and listening. Speaking and

listening must be separately endorsed on the certificate.

Cambridge IGCSE First Language English 0990

Grade 4 overall, with Merit in speaking and listening

Cambridge IGCSE Second Language English 0510/0511

0510: Grade C overall, with a minimum of grade 2 in speaking. Speaking must be separately endorsed on the certificate. 0511: Grade C overall.

Cambridge IGCSE Second Language English 0993/0991

0993: Grade 5 overall, with a minimum of grade 2 in speaking. Speaking must be separately endorsed on the certificate. 0991: Grade 5 overall.

Cambridge ESOL Level 2/3 Advanced

169 overall, with no paper below 162

Pre-sessional English

Do you need to complete a Pre-sessional English course to meet the English language requirements for this course?

The length of Pre-sessional English course you'll need to take depends on your current level of English language ability.

Pre-sessional English in detail

If you don't meet our English language requirements, we can use your most recent IELTS score, or the equivalent score in selected other English language tests, to determine the length of Pre-sessional English course you require.

Use the table below to check the course length you're likely to require for your current English language ability and see whether the course is available on campus or online.

Your most recent IELTS score	Pre-sessional English course length	On campus or online
5.5 overall, with no component below 5.5	6 weeks	On campus or online
5.5 overall, with no component below 5.0	10 weeks	On campus or online
5.0 overall, with no component below 5.0	12 weeks	Online
5.0 overall, with no component below 4.5	20 weeks	On campus
4.5 overall, with no component below 4.5	30 weeks	On campus
4.0 overall, with no component below 4.0	40 weeks	On campus

If you've completed an alternative English language test to IELTS, we may be able to use this to assess your English language ability and determine the Pre-sessional English course length you require.

Please see our guide to Pre-sessional English entry requirements for IELTS 6.0 overall, with no component below 5.5, for further details.

Back to top