UNIVERSITY OF LIVERPOOL

MMath

Mathematics

UCAS code G101

Entry requirements	Study mode	Duration
A level: ABB	Full-time	4 years

Apply by: **29 January 2025**
Starts on: **22 September 2025**

About this course

This four-year programme is ideal for ambitious students who want to study mathematics in depth. Graduates gain a master's qualification, which provides a competitive edge in the employment market and opens the door to careers in research.

Introduction

Mathematics is a beautiful and diverse subject. It underpins a wide range of disciplines, from physical sciences to social science, from biology to business and finance. The further your study of mathematics progresses, the more fascinating it becomes.

The University of Liverpool has a large Mathematical Sciences department with highly qualified staff, a first class reputation in teaching and research, and a friendly, supportive environment. We use mixed approaches to teaching and assessment, taking the best from traditional lectures, tutorials and assignments, and modern methods such as interactive learning sessions, video content and online assessment. Our programmes are designed with the needs of employers in mind, to give you a solid foundation from which you may take your career in whatever direction you choose.

The first two years of the MMath programme are the same as the Mathematics BSc. You will have the opportunity to learn about a range of fundamental topics, building on the mathematics you already know and providing the background for the more advanced modules in years three and four. No assumptions are made about whether you have previously studied mechanics, statistics or computer programming. In years three and four, we offer a wide range of advanced modules in pure mathematics, applied mathematics and statistics, enabling you to specialise in the areas of mathematics that interest you most. In the final year, students on this programme complete a substantial project on a mathematical topic of their own choice, supervised by an expert in the relevant field. Graduates completing the programme have experience of mathematics research and independent working skills that are highly valued by employers.

This programme also has a year abroad option, an incredible opportunity to spend an academic year at one of our partner universities. On the four-year integrated master's programme, you can go abroad either between years two and three (apply in year two), or between years three and four (apply in year three).

What you'll learn

- Fundamentals of pure and applied mathematics, probability and statistics
- Advanced material from the branches of mathematics that interest you most
- Teamwork
- Digital fluency
- Sophisticated problem solving skills
- How to communicate complex ideas

Accreditation

Liverpool's MMath degree is accredited by the Institute of Mathematics and its Applications (IMA) and the Royal Statistical Society (RSS)

Accreditation in detail

Royal Statistical Society

The RSS is a professional body for all statisticians and data analysts - www.rss.org.uk.

Back to top

Course content

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

Year one

All students on the programme take the same modules in year one. These build on the mathematics you already know, and lay the foundations for the more advanced material introduced later.

In year one you will study a range of compulsory modules.

Modules

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

Programme details and modules listed are illustrative only and subject to change.

Year two

In year two, all students take five core modules that are important to all branches of mathematics. Our range of optional modules also allows you to begin to specialise in the areas that interest you most.

Modules

Compulsory modules	Credits
DIFFERENTIAL EQUATIONS (MATH221)	15
VECTOR CALCULUS WITH APPLICATIONS IN FLUID MECHANICS (MATH225)	15
LINEAR ALGEBRA AND GEOMETRY (MATH244)	15
STATISTICS AND PROBABILITY I (MATH253)	15
COMPLEX FUNCTIONS (MATH243)	15

Optional modules	Credits
CLASSICAL MECHANICS (MATH228)	15
METRIC SPACES AND CALCULUS (MATH242)	15
COMMUTATIVE ALGEBRA (MATH247)	15
STATISTICS AND PROBABILITY II (MATH254)	15
FINANCIAL MATHEMATICS (MATH260)	15
OPERATIONAL RESEARCH (MATH269)	15

Optional modules	Credits
STEM EDUCATION AND COMMUNICATION (MATH291)	15
NUMERICAL METHODS FOR APPLIED MATHEMATICS (MATH226)	15

Programme details and modules listed are illustrative only and subject to change.

Year three

Students in year three choose six modules with codes beginning MATH3. These honours level modules contain the most advanced material that is usually taught on the Mathematics BSc. Students also choose two modules with codes beginning MATH4. These are master's level modules, taught by experts in the relevant fields, with the most sophisticated content to be found anywhere on our mathematics degrees. There are no compulsory modules in year three, but the options available to individual students will vary depending on choices made in year two.

Modules

Optional modules	Credits
FURTHER METHODS OF APPLIED MATHEMATICS (MATH323)	15
CARTESIAN TENSORS AND MATHEMATICAL MODELS OF SOLIDS AND VISCOUS FLUIDS (MATH324)	15
QUANTUM MECHANICS (MATH325)	15
RELATIVITY (MATH326)	15
NUMBER THEORY (MATH342)	15
GROUP THEORY (MATH343)	15

Optional modules	Credits
DIFFERENTIAL GEOMETRY (MATH349)	15
APPLIED PROBABILITY (MATH362)	15
LINEAR STATISTICAL MODELS (MATH363)	15
GAME THEORY (MATH331)	15
NUMERICAL METHODS FOR ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (MATH336)	15
COMBINATORICS (MATH344)	15
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
STOCHASTIC THEORY AND METHODS IN DATA SCIENCE (MATH368)	15
MORE IS DIFFERENT: STATISTICAL MECHANICS, THERMODYNAMICS, AND ALL THAT (MATH327)	15
PROFESSIONAL PROJECTS AND EMPLOYABILITY IN MATHEMATICS (MATH390)	15

Optional modules	Credits
MATHS SUMMER INDUSTRIAL RESEARCH PROJECT (MATH391)	15
APPLIED STOCHASTIC MODELS (MATH360)	15
LINEAR DIFFERENTIAL OPERATORS IN MATHEMATICAL PHYSICS (MATH421)	15
QUANTUM FIELD THEORY (MATH425)	15
STOCHASTIC ANALYSIS AND ITS APPLICATIONS (MATH483)	15
MATH499 - PROJECT FOR M.MATH. (MATH499)	15
ADVANCED TOPICS IN MATHEMATICAL BIOLOGY (MATH426)	15
WAVES, MATHEMATICAL MODELLING (MATH427)	15
ASYMPTOTIC METHODS FOR DIFFERENTIAL EQUATIONS (MATH433)	15
MATHEMATICAL BIOLOGY (MATH335)	15
MATHEMATICS OF NETWORKS AND EPIDEMICS (MATH338)	15
MANIFOLDS, HOMOLOGY AND MORSE THEORY (MATH410)	15
REPRESENTATION THEORY OF FINITE GROUPS (MATH442)	15
RIEMANN SURFACES (MATH445)	15
SINGULARITY THEORY OF DIFFERENTIABLE MAPPINGS (MATH455)	15
INTRODUCTION TO STRING THEORY (MATH423)	15
INTRODUCTION TO MODERN PARTICLE THEORY (MATH431)	15

Optional modules	Credits
HIGHER ARITHMETIC (MATH441)	15
ELLIPTIC CURVES (MATH444)	15
GEOMETRY OF CONTINUED FRACTIONS (MATH447)	15
ALGEBRAIC GEOMETRY (MATH448)	15
GALOIS THEORY (MATH449)	15

Programme details and modules listed are illustrative only and subject to change.

Year four

Students in year four complete a project in an area of mathematics of their choice, supervised by one of our expert staff. This gives you the opportunity to experience research in mathematics, and to develop your skills in independent working, technical writing, communicating complex ideas and presenting your work. Additional credits are earned through choosing optional modules not taken in year three. There are no compulsory modules in year four, but the options available to individual students will vary depending on choices made in years two and three.

Modules

Optional modules	Credits
LINEAR DIFFERENTIAL OPERATORS IN MATHEMATICAL PHYSICS (MATH421)	15
QUANTUM FIELD THEORY (MATH425)	15
STOCHASTIC ANALYSIS AND ITS APPLICATIONS (MATH483)	15
MATH499 - PROJECT FOR M.MATH. (MATH499)	15

Optional modules	Credits
MATH490 - PROJECT FOR M.MATH. (MATH490)	30
ADVANCED TOPICS IN MATHEMATICAL BIOLOGY (MATH426)	15
WAVES, MATHEMATICAL MODELLING (MATH427)	15
ASYMPTOTIC METHODS FOR DIFFERENTIAL EQUATIONS (MATH433)	15
FURTHER METHODS OF APPLIED MATHEMATICS (MATH323)	15
CARTESIAN TENSORS AND MATHEMATICAL MODELS OF SOLIDS AND VISCOUS FLUIDS (MATH324)	15
QUANTUM MECHANICS (MATH325)	15
RELATIVITY (MATH326)	15
NUMBER THEORY (MATH342)	15
GROUP THEORY (MATH343)	15
DIFFERENTIAL GEOMETRY (MATH349)	15
APPLIED STOCHASTIC MODELS (MATH360)	15
APPLIED PROBABILITY (MATH362)	15
LINEAR STATISTICAL MODELS (MATH363)	15
GAME THEORY (MATH331)	15
NUMERICAL METHODS FOR ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (MATH336)	15

Optional modules	Credits
COMBINATORICS (MATH344)	15
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
STOCHASTIC THEORY AND METHODS IN DATA SCIENCE (MATH368)	15
MORE IS DIFFERENT: STATISTICAL MECHANICS, THERMODYNAMICS, AND ALL THAT (MATH327)	15
PROFESSIONAL PROJECTS AND EMPLOYABILITY IN MATHEMATICS (MATH390)	15
MATHS SUMMER INDUSTRIAL RESEARCH PROJECT (MATH391)	15
MATHEMATICAL BIOLOGY (MATH335)	15
MATHEMATICS OF NETWORKS AND EPIDEMICS (MATH338)	15
MANIFOLDS, HOMOLOGY AND MORSE THEORY (MATH410)	15
REPRESENTATION THEORY OF FINITE GROUPS (MATH442)	15

Optional modules	Credits
RIEMANN SURFACES (MATH445)	15
SINGULARITY THEORY OF DIFFERENTIABLE MAPPINGS (MATH455)	15
INTRODUCTION TO STRING THEORY (MATH423)	15
INTRODUCTION TO MODERN PARTICLE THEORY (MATH431)	15
HIGHER ARITHMETIC (MATH441)	15
ELLIPTIC CURVES (MATH444)	15
GEOMETRY OF CONTINUED FRACTIONS (MATH447)	15
ALGEBRAIC GEOMETRY (MATH448)	15
GALOIS THEORY (MATH449)	15

Programme details and modules listed are illustrative only and subject to change.

Teaching and assessment

How you'll learn

We use a range of teaching methods, including traditional lectures and tutorials, video content, interactive learning sessions and one-to-one project supervision. Opportunities for individual discussions are provided for every taught module, for example via online forums or staff office hours.

How you're assessed

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

Liverpool Hallmarks

We have a distinctive approach to education, the Liverpool Curriculum Framework, which focuses on research-connected teaching, active learning, and authentic assessment to ensure our students graduate as digitally fluent and confident global citizens.

The Liverpool Curriculum framework sets out our distinctive approach to education. Our teaching staff support our students to develop academic knowledge, skills, and understanding alongside our **graduate attributes**:

- Digital fluency
- Confidence
- Global citizenship

Our curriculum is characterised by the three **Liverpool Hallmarks**:

- Research-connected teaching
- Active learning
- Authentic assessment

All this is underpinned by our core value of **inclusivity** and commitment to providing a curriculum that is accessible to all students.

Back to top

Careers and employability

A mathematically-based degree opens up a wide range of career opportunities, including some of the most lucrative professions as employers value mathematicians' high level of numeracy and problem solving skills.

Typical types of work our graduates have gone onto include:

- actuarial trainee analyst in the audit practice
- graduate management trainee risk analyst
- trainee chartered accountant on a graduate business programme.

Recent employers of our graduates include:

- Aston University
- Deloitte
- EuroMoney Training
- Norwich Union
- Venture Marketing Group
- Wolsley Group.

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 - £9,535
Year abroad fee - £1,430 (applies to year in China)

International fees

Full-time place, per year - £26,600
Year abroad fee - £13,300 (applies to year in China)

The tuition fees shown are correct for 2025/26 entry. Please note that the year abroad fee also applies to the year in China.

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** with **A** in the EPQ.

You may automatically qualify for reduced entry requirements through our contextual offers scheme. Based on your personal circumstances, you may automatically qualify for up to a two-grade reduction in the entry requirements needed for this course. When you apply, we consider a range of factors – such as where you live – to assess if you're eligible for a grade reduction. You don't have to make an application for a grade reduction – we'll do all the work.

Find out more about how we make reduced grade offers.

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

33 including 6 in Higher 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

Acceptable at grade B or above alongside AB at A level including grade A in Mathematics.

Access

Access - 45 Level 3 credits in graded units in a relevant Diploma, including 39 at Distinction and a further 6 with at least Merit. 15 Distinctions are required in Mathematics.

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.

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

78 overall, with minimum scores of listening 17, writing 17, reading 17 and speaking 19. TOEFL Home Edition not accepted.

TOEFL Paper

Grade 6 at Standard Level or grade 5 at Higher Level

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

LanguageCert

Grade 4 at Standard Level or grade 4 at Higher Level

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
5.5 overall, with no component below 5.0	10 weeks	On campus and online options available
5.0 overall, with no component below 5.0	12 weeks	On campus and online options available
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.

Alternative entry requirements

- If your qualification isn't listed here, or you're taking a combination of qualifications, contact us for advice
- If you are returning to learning, have had a disrupted education or are switching career pathways, the one-year Go Higher diploma qualifies you to apply for

University of Liverpool arts, humanities and social sciences programmes

- Applications from mature students are welcome.

Back to top

Generated: 28 Mar 2025, 10:22