



BSc (Hons)

# Mathematics

UCAS code G100

## Entry requirements

A level: ABB

## Study mode

Full-time

## Duration

3 years

Apply by: **29 January 2025**

Starts on: **22 September 2025**

## About this course

Studying Mathematics at Liverpool is an excellent foundation for a wide range of careers. At Liverpool you will be part of a department which is first-class in teaching and research.

## Introduction

Mathematics is a fascinating, beautiful and diverse subject to study. It underpins a wide range of disciplines; from physical sciences to social science, from biology to business and finance. At Liverpool, 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 any number of directions.

A Mathematics degree at the University of Liverpool is an excellent investment in your future. We have a large department with highly qualified staff, a first-class reputation in teaching and research, and a great city in which to live and work. You will see a broad range of degree programmes at Liverpool – Mathematics can be combined with many other subjects to widen your options even further.

In the first two years of this programme, you will study a range of topics covering important areas of both pure and applied mathematics, no assumptions are made about whether or not you have previously studied mechanics or statistics, or have previous experience of the use of computers. The modules studied in year one help

to get all students at the same level, studying fundamental ideas and reinforcing A level work.

This programme also has a year abroad option, an incredible opportunity to spend an academic year at one of our partner universities.

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## **What you'll learn**

- Pure mathematics
  - Applied mathematics
  - Problem solving
  - Team work
  - How to communicate and present clearly
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## **Accreditation**

Both accreditations can be achieved on a conditional basis. Accreditations depend on your choice and your performance on optional modules.

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### **Accreditation in detail**

## **Institute of Mathematics and its Applications (IMA)**

The IMA is the professional learned institute for mathematicians, supporting the advancement of mathematical knowledge and its applications to promote and enhance mathematical practice for the benefit of society.

## **Royal Statistical Society**

The RSS is a professional body for all statisticians and data analysts  
- [www.rss.org.uk](http://www.rss.org.uk)

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# Course content

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

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## Year one

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

## Modules

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

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

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## Year two

In the second and following years of study, there is a wide range of modules. In year two, you will choose some compulsory and 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.

Towards the end of Year 2 Semester 1, you will be asked to choose one of the following 4 pathways: Applied Mathematics (AM), Pure Mathematics (PM), Stochastics, Probability and Operational Research (SPOR) or Theoretical Physics (TP). Each pathway is a coherent collection of modules which cover a particular area of mathematics.

It will be important to consider which pathways you might be interested in following in year 3, when making your year 2 module choices. In particular, you should ensure that you have the necessary prerequisites:

Applied Mathematics Pathway: MATH226 is recommended, further suitable modules include MATH228.

Pure Mathematics Pathway: MATH247 is strongly recommended, MATH242 is recommended.

Statistics, Probability and Operational Research Pathway: MATH254 is compulsory, MATH269 is recommended, further suitable modules include MATH226, MATH242 and MATH260.

Theoretical Physics Pathway: MATH228 is compulsory.

## Modules

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

<b>Compulsory modules</b>	<b>Credits</b>
<u>METRIC SPACES AND CALCULUS (MATH241)</u>	15

  

<b>Optional modules</b>	<b>Credits</b>
<u>CLASSICAL MECHANICS (MATH228)</u>	15
<u>METRIC SPACES AND CALCULUS (MATH242)</u>	15
<u>COMMUTATIVE ALGEBRA (MATH247)</u>	15
<u>STATISTICS AND PROBABILITY II (MATH254)</u>	15
<u>FINANCIAL MATHEMATICS (MATH260)</u>	15
<u>OPERATIONAL RESEARCH (MATH269)</u>	15
<u>STEM EDUCATION AND COMMUNICATION (MATH291)</u>	15
<u>NUMERICAL METHODS FOR APPLIED MATHEMATICS (MATH226)</u>	15

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

## **Year three**

In year three, you will choose some compulsory and some optional modules from the list below. Please note that we regularly review our teaching so the choice of modules may change.

Depending on the chosen pathway, the following modules are compulsory:

Applied Mathematics: MATH323, MATH324, MATH335.

Pure Mathematics: MATH342, MATH343, MATH349.

Statistics, Probability and Operational Research: MATH360, MATH362, MATH363.

Theoretical Physics: MATH323, MATH325, MATH326.

# Modules

Optional modules	Credits
<u>FURTHER METHODS OF APPLIED MATHEMATICS (MATH323)</u>	15
<u>CARTESIAN TENSORS AND MATHEMATICAL MODELS OF SOLIDS AND VISCOUS FLUIDS (MATH324)</u>	15
<u>QUANTUM MECHANICS (MATH325)</u>	15
<u>RELATIVITY (MATH326)</u>	15
<u>NUMBER THEORY (MATH342)</u>	15
<u>GROUP THEORY (MATH343)</u>	15
<u>DIFFERENTIAL GEOMETRY (MATH349)</u>	15
<u>APPLIED PROBABILITY (MATH362)</u>	15
<u>LINEAR STATISTICAL MODELS (MATH363)</u>	15
<u>GAME THEORY (MATH331)</u>	15
<u>NUMERICAL METHODS FOR ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (MATH336)</u>	15
<u>COMBINATORICS (MATH344)</u>	15
<u>THE MAGIC OF COMPLEX NUMBERS: COMPLEX DYNAMICS, CHAOS AND THE MANDELBROT SET (MATH345)</u>	15
<u>TOPOLOGY (MATH346)</u>	15
<u>APPLIED STOCHASTIC MODELS (MATH360)</u>	15

Optional modules	Credits
<u>THEORY OF STATISTICAL INFERENCE (MATH361)</u>	15
<u>MEDICAL STATISTICS (MATH364)</u>	15
<u>MEASURE THEORY AND PROBABILITY (MATH365)</u>	15
<u>MATHEMATICAL RISK THEORY (MATH366)</u>	15
<u>NETWORKS IN THEORY AND PRACTICE (MATH367)</u>	15
<u>STOCHASTIC THEORY AND METHODS IN DATA SCIENCE (MATH368)</u>	15
<u>MORE IS DIFFERENT: STATISTICAL MECHANICS, THERMODYNAMICS, AND ALL THAT (MATH327)</u>	15
<u>PROFESSIONAL PROJECTS AND EMPLOYABILITY IN MATHEMATICS (MATH390)</u>	15
<u>MATHEMATICAL BIOLOGY (MATH335)</u>	15
<u>MATHEMATICS OF NETWORKS AND EPIDEMICS (MATH338)</u>	15
<u>MATHS SUMMER INDUSTRIAL RESEARCH PROJECT (MATH391)</u>	15

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

## Teaching and assessment

### How you'll learn

Your learning activities will consist of lectures, tutorials, practical classes, problem classes, private study and supervised project work.

In year one, lectures are supplemented by a thorough system of group tutorials and computing work is carried out in supervised practical classes. Key study skills, presentation skills and group work start in first-year tutorials and are developed later



in the programme. The emphasis in most modules is on the development of problem solving skills, which are regarded very highly by employers.

Project supervision is on a one-to-one basis, apart from group projects in year two.

## How you're assessed

Most modules are assessed by a two and a half hour examination in January or May, but many have an element of coursework assessment. This might be through homework, class tests, mini-project work or key skills exercises. You will be taught by internationally recognised experts within a friendly department.

## 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.

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# 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

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# 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.](#)

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## 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.

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# Entry requirements

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

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## 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](#).

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 \(Hons\)](#)

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## T levels

T levels are not currently accepted.

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## GCSE

4/C in English and 4/C in Mathematics

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## 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.

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## BTEC Level 3 National Extended Diploma

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

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### **International Baccalaureate**

33 including 6 in Higher Mathematics.

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### **Irish Leaving Certificate**

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

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### **Scottish Higher/Advanced Higher**

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

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### **Welsh Baccalaureate Advanced**

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

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### **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.

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### **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.

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# 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.

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## **IELTS**

6.0 overall, with no component below 5.5

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## **TOEFL iBT**

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

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## **TOEFL Paper**

Grade 6 at Standard Level or grade 5 at Higher Level

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## **Duolingo English Test**

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

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## **Pearson PTE Academic**

59 overall, with no component below 59

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## **LanguageCert Academic**

65 overall, with no skill below 60

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## **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.

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### **Cambridge IGCSE First Language English 0990**

Grade 4 overall, with Merit in speaking and listening

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### **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.

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### **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.

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### **Cambridge ESOL Level 2/3 Advanced**

169 overall, with no paper below 162

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### **LanguageCert**

Grade 4 at Standard Level or grade 4 at Higher Level

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## **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.

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### **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.

<b>Your most recent IELTS score</b>	<b>Pre-sessional English course length</b>	<b>On campus or online</b>
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.

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## **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.

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