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BSc (Hons)

# Mathematics and Computer Science

UCAS code GG14

## Entry requirements

A level: AAB

## Study mode

Full-time

## Duration

3 years

Apply by: **30 June 2026**

Starts on: **28 September 2026**

## About this course

Mathematicians and computer scientists are amongst the most highly-prized graduates today.

## Introduction

On this programme, you will divide your studies more or less equally between the two subjects, studying modules from Mathematics and Computer Science.

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.

From the underlying principles to the very edge of modern technology, this programme will cover aspects of Computer Science and ensure that when you graduate you will know exactly

what is and isn't possible with computers.

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## What you'll learn

- Pure mathematics
- Applied mathematics
- Problem solving
- Team work
- How to communicate and present clearly
- Understanding different computer systems
- Building and structuring databases
- Fundamentals of software engineering
- Algorithmic foundations
- Complexity of algorithms and decision

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# Course content

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

## Year one

Year one of the programme has been designed as an even split between subjects related to computing and mathematics.

In year one students will typically undertake either COMP101 (Introduction to Programming) or COMP105 (Programming Language Paradigms) based on prior exposure to programming (eg Computer Science A level). Students without a background will normally study COMP101, however in some instances may be permitted to enrol on COMP105 instead.

All other year one modules are required.

## Modules

Compulsory modules	Credits
CALCULUS I (MATH101)	15
CALCULUS II (MATH102)	15
DATA STRUCTURES AND ALGORITHMS (COMP108)	15
DESIGNING SYSTEMS FOR THE DIGITAL SOCIETY (COMP107)	15
INTRODUCTION TO LINEAR ALGEBRA (MATH103)	15
OBJECT-ORIENTED PROGRAMMING (COMP122)	15
INTRODUCTION TO PROGRAMMING (COMP101)	15
PROGRAMMING LANGUAGE PARADIGMS (COMP105)	15

Optional modules	Credits
NEWTONIAN MECHANICS (MATH122)	15
NUMBERS, GROUPS AND CODES (MATH142)	15
INTRODUCTION TO STATISTICS USING R (MATH163)	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 continue with a mix of modules related to computer science and mathematics but also have the opportunity to specialise in certain subject areas of your choice.

## Modules

Compulsory modules	Credits
COMPLEXITY OF ALGORITHMS (COMP202)	15

  

Optional modules	Credits
COMPUTER NETWORKS (COMP211)	15

<b>Optional modules</b>	<b>Credits</b>
INTRODUCTION TO DATA SCIENCE (COMP229)	15
COMPUTER SYSTEMS (COMP124)	15
DATABASE DEVELOPMENT (COMP207)	15
INTRODUCTION TO THEORY OF COMPUTATION (COMP218)	15
VECTOR CALCULUS WITH APPLICATIONS IN FLUID MECHANICS (MATH225)	15
CLASSICAL MECHANICS (MATH228)	15
COMPLEX FUNCTIONS (MATH243)	15
LINEAR ALGEBRA AND GEOMETRY (MATH244)	15
COMMUTATIVE ALGEBRA (MATH247)	15
OPERATIONAL RESEARCH: PROBABILISTIC MODELS (MATH268)	15
FINANCIAL MATHEMATICS (MATH260)	15
INTRODUCTION TO ARTIFICIAL INTELLIGENCE (COMP111)	15
CYBER SECURITY (COMP232)	15
GROUP SOFTWARE PROJECT (COMP208)	15
DISTRIBUTED SYSTEMS (COMP212)	15
COMPUTER-BASED TRADING IN FINANCIAL MARKETS (COMP226)	15

Optional modules	Credits
STATISTICS AND PROBABILITY I (MATH253)	15
PRINCIPLES OF COMPUTER GAMES DESIGN AND IMPLEMENTATION (COMP222)	15
DIFFERENTIAL EQUATIONS (MATH221)	15
SOFTWARE ENGINEERING I (COMP201)	15
STATISTICS AND PROBABILITY II (MATH254)	15
METRIC SPACES AND CALCULUS (MATH242)	15
OPERATIONAL RESEARCH: LINEAR AND CONVEX METHODS (MATH269)	15
NUMERICAL METHODS (MATH226)	15

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## Year three

### Modules

Optional modules	Credits
KNOWLEDGE REPRESENTATION AND REASONING (COMP304)	15

<b>Optional modules</b>	<b>Credits</b>
BIOCOMPUTATION (COMP305)	15
EFFICIENT SEQUENTIAL ALGORITHMS (COMP309)	15
MULTI-AGENT SYSTEMS (COMP310)	15
FORMAL METHODS (COMP313)	15
SOFTWARE ENGINEERING II (COMP319)	15
INTRODUCTION TO COMPUTATIONAL GAME THEORY (COMP323)	15
COMPUTATIONAL GAME THEORY AND MECHANISM DESIGN (COMP326)	15
OPTIMISATION (COMP331)	15
FURTHER METHODS OF APPLIED MATHEMATICS (MATH323)	15
CARTESIAN TENSORS AND MATHEMATICAL MODELS OF SOLIDS AND VISCOUS FLUIDS (MATH324)	15
QUANTUM MECHANICS (MATH325)	15
GROUP THEORY (MATH343)	15
COMBINATORICS (MATH344)	15
APPLIED PROBABILITY (MATH362)	15
LINEAR STATISTICAL MODELS (MATH363)	15
NETWORKS IN THEORY AND PRACTICE (MATH367)	15

Optional modules	Credits
ADVANCED ARTIFICIAL INTELLIGENCE (COMP219)	15
FINAL YEAR SECOND SEMESTER 15 CREDIT PROJECT (COMP392)	15
NETWORK MINING AND ANALYSIS (COMP324)	15
COMMUNICATING COMPUTER SCIENCE (COMP335)	15
DATA MINING AND VISUALISATION (COMP337)	15
RELATIVITY (MATH326)	15
DIFFERENTIAL GEOMETRY (MATH349)	15
GAME THEORY (MATH331)	15
MATHEMATICAL RISK THEORY (MATH366)	15
MEDICAL STATISTICS (MATH364)	15
NUMBER THEORY (MATH342)	15
THEORY OF STATISTICAL INFERENCE (MATH361)	15
ADVANCED TOPICS IN COMPUTER GAME DEVELOPMENT (COMP342)	15
PROFESSIONAL PROJECTS AND EMPLOYABILITY IN MATHEMATICS (MATH390)	15
CLOUD COMPUTING FOR E-COMMERCE (COMP315)	15
QUANTUM COMPUTING AND SECURITY (COMP345)	15

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## **Teaching and assessment**

### **How you'll learn**

Teaching is by a mix of formal lectures, small group tutorials and supervised laboratory-based practical sessions. Students also undertake individual and group projects. Key problem solving skills and employability skills, like presentation and teamwork skills, are developed throughout the programme.

### **How you're assessed**

The main modes of assessment are through a combination of coursework and examination, but depending on the modules taken you may encounter project work, presentations (individual or group), and specific tests/tasks focused on solidifying learning outcomes.

## **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.

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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.

Recent employers of our graduates are:

- Barclays Bank plc
- Deloitte
- Forrest Recruitment
- Marks and Spencer
- Mercer Human Resource Consulting Ltd
- Venture Marketing Group
- BAE Systems
- BT
- Guardian Media Group
- Royal Bank of Scotland
- Siemens
- Unilever.

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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 - £9,790

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.



# Entry requirements

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

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## A levels

AAB

including grade A in Maths. Mathematics (Pure), Mathematics (Pure and Applied), Mathematics (Pure) and Statistics, and Mathematics (Pure) and Statistics are acceptable.

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

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:

- [Computer Science \(Foundation\) \(4 year route with Carmel College\)](#) BSc (Hons)
- [Mathematical Sciences BSc \(Hons\) \(Foundation, 4 year route with Carmel College\)](#) BSc (Hons)

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## T levels

You'll need T level Science or ICT, alongside A level Mathematics. T Level Science or ICT is accepted with an overall grade of Distinction to include the grade of Distinction in the specialism component and grade B in the core.

Applicants should contact us by [completing the enquiry form on our website](#) to discuss specific requirements in the core components and the occupational specialism.

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## GCSE

Further Education requirements, in addition to Level 3 GCSE qualifications, must be met. GCSE grade minimum 4/C in English and 4/C in Mathematics.

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### **Subject requirements**

A level Mathematics at grade A is required. 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 Certificate**

Distinction in BTEC and AA in A levels including Mathematics.

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### **BTEC Level 3 Diploma**

DD in BTEC and grade A in A level Mathematics.

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### **BTEC Level 3 National Extended Diploma**

DDD in relevant Diploma (Computer Science, Mathematics, Engineering, IT) and A level Mathematics grade A. Not accepted without A level Mathematics.

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### **International Baccalaureate**

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

IB Maths 'Analysis and Approaches' or 'Applications and Interpretation' pathways are acceptable at Higher Level as a Mathematical subject

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### **Irish Leaving Certificate**

H1,H1,H2,H2,H3, including H1 in Mathematics.

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

Acceptable on same basis as A levels or higher grades AAABB and Advanced Higher grade A in Maths.

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### **Welsh Baccalaureate Advanced**

Acceptable at grade B alongside A level Mathematics at grade A and one other A level at grade A.

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### **Cambridge Pre-U Diploma**

Principal subjects acceptable in lieu of A levels. D3 in Cambridge Pre U Principal Subject is accepted as equivalent to A-Level grade A M2 in Cambridge Pre U Principal Subject is accepted as equivalent to A-Level grade B Global Perspectives and Short Courses are not accepted.

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### **Access**

Pass Access to HE Diploma in a relevant subject with 36 Level 3 credits at Distinction (including 15 in Mathematical credits) and 9 Level 3 credits at Merit.

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### **International qualifications**

Select your country or region to view specific entry requirements.

Many countries have a different education system to that of the UK, meaning your qualifications may not meet our direct entry requirements. Although there is no direct Foundation Certificate route to this course, completing a Foundation Certificate, such as that offered by the University of Liverpool International College, can guarantee you a place on a number of similar courses which may interest you.

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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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## **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**

If you took a TOEFL test on or before 20 January 2026, you'll need 88 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 4.5 overall, with 4 or above in all components. TOEFL Home Edition not accepted.

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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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## **International Baccalaureate English A: Literature or Language & Literature**

Grade 4 at Standard Level or grade 4 at Higher Level

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## **International Baccalaureate English B**

Grade 6 at Standard Level or grade 5 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 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.

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