

BSc (Hons)

# Mathematics and Computer Science with a Year in Industry

UCAS code GG16

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

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

## About this course

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

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## 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.

On this **year in industry** programme, you will spend year three of this programme on a year-long placement with an approved company/organisation. During this time, you will develop work-based transferrable skills and professional competences

leading to enhanced employability which will make you well placed to take up opportunities in project-based, research and management roles.

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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 computer science 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
<a href="#"><u>CALCULUS I (MATH101)</u></a>	15
<a href="#"><u>CALCULUS II (MATH102)</u></a>	15
<a href="#"><u>DATA STRUCTURES AND ALGORITHMS (COMP108)</u></a>	15
<a href="#"><u>DESIGNING SYSTEMS FOR THE DIGITAL SOCIETY (COMP107)</u></a>	15
<a href="#"><u>INTRODUCTION TO LINEAR ALGEBRA (MATH103)</u></a>	15
<a href="#"><u>OBJECT-ORIENTED PROGRAMMING (COMP122)</u></a>	15

Optional modules	Credits
<a href="#"><u>NEWTONIAN MECHANICS (MATH122)</u></a>	15
<a href="#"><u>NUMBERS, GROUPS AND CODES (MATH142)</u></a>	15
<a href="#"><u>INTRODUCTION TO PROGRAMMING (COMP101)</u></a>	15
<a href="#"><u>PROGRAMMING LANGUAGE PARADIGMS (COMP105)</u></a>	15
<a href="#"><u>INTRODUCTION TO STATISTICS USING R (MATH163)</u></a>	15

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

## 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
<a href="#"><u>COMPLEXITY OF ALGORITHMS (COMP202)</u></a>	15

  

Optional modules	Credits
<a href="#"><u>COMPUTER NETWORKS (COMP211)</u></a>	15
<a href="#"><u>COMPUTER SYSTEMS (COMP124)</u></a>	15
<a href="#"><u>DATABASE DEVELOPMENT (COMP207)</u></a>	15

Optional modules	Credits
<u>INTRODUCTION TO THEORY OF COMPUTATION (COMP218)</u>	15
<u>VECTOR CALCULUS WITH APPLICATIONS IN FLUID MECHANICS (MATH225)</u>	15
<u>CLASSICAL MECHANICS (MATH228)</u>	15
<u>COMPLEX FUNCTIONS (MATH243)</u>	15
<u>LINEAR ALGEBRA AND GEOMETRY (MATH244)</u>	15
<u>COMMUTATIVE ALGEBRA (MATH247)</u>	15
<u>OPERATIONAL RESEARCH: PROBABILISTIC MODELS (MATH268)</u>	15
<u>FINANCIAL MATHEMATICS (MATH260)</u>	15
<u>INTRODUCTION TO ARTIFICIAL INTELLIGENCE (COMP111)</u>	15
<u>CYBER SECURITY (COMP232)</u>	15
<u>GROUP SOFTWARE PROJECT (COMP208)</u>	15
<u>DISTRIBUTED SYSTEMS (COMP212)</u>	15
<u>COMPUTER-BASED TRADING IN FINANCIAL MARKETS (COMP226)</u>	15
<u>STATISTICS AND PROBABILITY I (MATH253)</u>	15
<u>PRINCIPLES OF COMPUTER GAMES DESIGN AND IMPLEMENTATION (COMP222)</u>	15
<u>DIFFERENTIAL EQUATIONS (MATH221)</u>	15
<u>STATISTICS AND PROBABILITY II (MATH254)</u>	15

Optional modules	Credits
<a href="#"><u>METRIC SPACES AND CALCULUS (MATH242)</u></a>	15
<a href="#"><u>OPERATIONAL RESEARCH (MATH269)</u></a>	15
<a href="#"><u>NUMERICAL METHODS FOR APPLIED MATHEMATICS (MATH226)</u></a>	15
<a href="#"><u>SOFTWARE ENGINEERING I (COMP201)</u></a>	15

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

## Year in Industry (Year three)

Year three of the programme is taken up with a placement in a professional software industry environment.

## Modules

Compulsory modules	Credits
<a href="#"><u>INDUSTRIAL PLACEMENT Y3 (COMP299)</u></a>	120

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

## Year four

## Modules

Optional modules	Credits
<a href="#"><u>KNOWLEDGE REPRESENTATION AND REASONING (COMP304)</u></a>	15

Optional modules	Credits
<u>BIOCOMPUTATION (COMP305)</u>	15
<u>EFFICIENT SEQUENTIAL ALGORITHMS (COMP309)</u>	15
<u>MULTI-AGENT SYSTEMS (COMP310)</u>	15
<u>FORMAL METHODS (COMP313)</u>	15
<u>SOFTWARE ENGINEERING II (COMP319)</u>	15
<u>INTRODUCTION TO COMPUTATIONAL GAME THEORY (COMP323)</u>	15
<u>COMPUTATIONAL GAME THEORY AND MECHANISM DESIGN (COMP326)</u>	15
<u>OPTIMISATION (COMP331)</u>	15
<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>GROUP THEORY (MATH343)</u>	15
<u>COMBINATORICS (MATH344)</u>	15
<u>APPLIED PROBABILITY (MATH362)</u>	15
<u>LINEAR STATISTICAL MODELS (MATH363)</u>	15
<u>NETWORKS IN THEORY AND PRACTICE (MATH367)</u>	15
<u>ADVANCED ARTIFICIAL INTELLIGENCE (COMP219)</u>	15

Optional modules	Credits
<u>FINAL YEAR SECOND SEMESTER 15 CREDIT PROJECT (COMP392)</u>	15
<u>COMPLEX INFORMATION NETWORKS (COMP324)</u>	15
<u>COMMUNICATING COMPUTER SCIENCE (COMP335)</u>	15
<u>DATA MINING AND VISUALISATION (COMP337)</u>	15
<u>RELATIVITY (MATH326)</u>	15
<u>DIFFERENTIAL GEOMETRY (MATH349)</u>	15
<u>GAME THEORY (MATH331)</u>	15
<u>MATHEMATICAL RISK THEORY (MATH366)</u>	15
<u>MEDICAL STATISTICS (MATH364)</u>	15
<u>NUMBER THEORY (MATH342)</u>	15
<u>PROJECTS IN MATHEMATICS (MATH399)</u>	15
<u>THEORY OF STATISTICAL INFERENCE (MATH361)</u>	15
<u>ADVANCED TOPICS IN COMPUTER GAME DEVELOPMENT (COMP342)</u>	15

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

## 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 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.

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 – £9,535

Year in industry fee – £1,905

### International fees

Full-time place, per year – £28,300

Year in industry fee – £1,905

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.

AAA with grade A in A level Maths.

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## A levels

AAA with grade A in Maths.

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

- [Computer Science \(Foundation\) \(4 year route with Carmel College\)](#) 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

Grade A in Mathematics 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**

Acceptable at grade Distinction\* (any subject) alongside AA at A level, including A Level Mathematics grade A.

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### **BTEC Level 3 Diploma**

Distinction\* Distinction in BTEC considered alongside A Level Mathematics grade A.

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

D\*D\*D plus A level Maths grade A.

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### **International Baccalaureate**

36 including 6 in Higher Level Mathematics.

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### **Irish Leaving Certificate**

H1,H1,H2,H2,H2,H2, including H1 in Higher Maths. We also require a minimum of H6 in Higher English or O3 in Ordinary English.

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

Acceptable on the same basis as A levels.

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### **Welsh Baccalaureate Advanced**

Acceptable at grade A or above alongside AA at A level including A Level Mathematics 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**

Considered if taking a relevant subject. 45 Level 3 credits at Distinction, including 15 Level 3 credits in Mathematics is required. GCSE English and Mathematics grade C/grade 4 or above also required.

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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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## **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**

## 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.

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	30 weeks	On campus



Your most recent IELTS score	Pre-sessional English course length	On campus or online
component below 4.5		
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
- [Applications from mature students](#) are welcome.

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