UNIVERSITY OF LIVERPOOL

MSc

Advanced Data Science and Artificial Intelligence with a Year in Industry

Study mode	Duration	
Full-time	24 months	Apply by: **11 September 2026** Starts on: **28 September 2026**

About this course

Gain hands-on experience of big data analytics, data mining and visualisation techniques using high-performance computer technology.

Introduction

Big data is increasingly important in the contemporary business and IT world. For many public and private enterprises, analysis of large-scale data sets is critical to growth. This MSc will prepare you for employment in an IT industry where big data professionals are in high demand.

You'll learn how to interrogate vast amounts of data and make informed insights from datasets that are too large to be readily processed using standard techniques.

In year one, we'll provide an overview of the key algorithms, algorithmic approaches and software environments you'll use when solving big data problems and explore data mining techniques. We'll also guide you in how to plan and conduct research.

Hands-on programming experience with the latest multi-core and multi-processor platforms will ensure your expertise in big data is underpinned by knowledge of high-performance computing. Further opportunities to specialise and enhance your knowledge of algorithms, optimisation and machine learning are available through a range of optional modules.

You'll work as part of a small group on a practical project to find a solution to a big data problem. We'll also provide a thorough grounding in how to plan and conduct research in preparation for your dissertation.

In year two, you'll undertake an industrial project in a real-world environment as part of an extended placement opportunity. While on placement, you'll develop transferable skills and gain insight into the operations, products, practices and culture of the placement provider.

Who is this course for?

The MSc in Advanced Data Science and Artifical Intelligence with a Year in Industry is designed for and directed at graduates with a previous Computer Science related degree.

Which postgraduate degree is right for you?
The Department of Computer Science offers master's programmes for students with undergraduate degrees in Computer Science and other disciplines.

If you have a Computer Science related degree, you could be eligible for the following master's courses:

- Advanced Computer Science MSc
- Advanced Computer Science with a Year in Industry MSc
- Advanced Data Science and Artificial Intelligence MSc
- Advanced Data Science and Artificial Intelligence with a Year in Industry MSc
- Theoretical Computer Science MSc
- Theoretical Computer Science with a Year in Industry MSc
- Cyber Security MSc.

Computer Science related degrees may include degree titles such as: Computer Applications, Computer Science, Computer Engineering, Computer Applications and Engineering, and Software Engineering. Please note that this list is not exhaustive. Any Computer Science related degree should contain a significant amount of computer science related modules to be relevant (as assessed by the Department of Computer Science).

If you don't have a Computer Science related degree and you are interested in learning more about the field, you may be eligible to study:

- Data Science and Artificial Intelligence MSc
- Data Science and Artificial Intelligence with a Year in Industry MSc
- Computer Science MSc

- Computer Science with a Year in Industry MSc
- Cyber Security MSc.

Please check individual course pages for detailed entry requirements.

What you'll learn

- Theoretical and practical aspects of programming for the latest multi-core and multi-processor platforms
- Key algorithms, approaches and software environments for developing solutions to big data problems
- Data mining techniques and challenges using real-world datasets
- Application of visualisation methods to data mining
- Research skills in computer science
- Bio-inspired algorithms for optimisation and machine learning
- How to model continuous and discrete optimisation problems
- The benefits and weaknesses of selected algorithmic techniques
- Algorithmic aspects of game theory
- Neural networks for artificial intelligence
- How to validate systems against safety specifications

Accreditation

The programme is accredited by BCS, The Chartered Institute for IT, for the purposes of partially meeting the academic requirement for registration as a Chartered IT Professional.

Accreditation in detail

BCS

The Chartered Institute for IT for the purposes of fully meeting the academic requirement for registration as

a Chartered IT Professional.

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 study four compulsory taught modules and four optional taught modules.

Modules

Compulsory modules	Credits
RESEARCH METHODS IN COMPUTER SCIENCE (COMP516)	15
BIG DATA ANALYTICS (COMP529)	15
DATA MINING AND VISUALISATION (COMP527)	15
MSC GROUP PROJECT (COMP530)	15

Optional modules	Credits
EFFICIENT ALGORITHMS (COMP526)	15
MULTI-CORE AND MULTI-PROCESSOR PROGRAMMING (COMP528)	15
QUANTUM COMPUTING AND SECURITY (COMP535)	15
OPTIMISATION (COMP557)	15

Optional modules	Credits
ONTOLOGIES AND SEMANTIC WEB (COMP318)	15
MACHINE LEARNING AND BIOINSPIRED OPTIMISATION (COMP532)	15
SAFETY AND DEPENDABILITY (COMP524)	15
ALGORITHMIC GAME THEORY (COMP559)	15
COMPUTATIONAL INTELLIGENCE (COMP575)	15

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

Year two

In Year Two, you'll undertake an industrial project, that's research or application oriented, in a real-world environment as part of an extended placement opportunity. For assessment purposes this placement is covered by the modules COMP599 MSc Industrial Project and COMP598 MSc Placement Experience.

Modules

Compulsory modules	Credits
MSC INDUSTRIAL PROJECT (COMP599)	60
MSC PLACEMENT EXPERIENCE (COMP598)	60

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

Teaching and assessment

How you'll learn

Teaching on the first year of this programme comprises formal lectures, small group tutorials and practical sessions in PC and Mac laboratories. You will also take part in one or more group projects. In your second year, you'll undertake an industrial project in a real-world environment.

How you're assessed

Taught modules in the first year of the course are assessed through a combination of examinations and coursework. The examinations take place at the end of each semester and typically take the form of an in-person written assignment, usually to be completed in a couple of hours. You'll be assigned coursework across the length of each semester. This typically takes the form of class tests, programming assignments or small projects.

The second year of the course is assessed through a portfolio of evidence from your industrial placement and a major project undertaken in your placement setting.

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

Designed to address a skills gap in the employment market, this MSc will enable you to apply your skills working with big data and your knowledge of high performance computing to real-world challenges.

Examples of relevant careers include, but are not limited to:

- Data analyst
- Data scientist
- Mathematical modeller
- Database administrator
- Machine learning engineer
- Statistician.

The transferable skills you develop will also prepare you for a variety of other roles across the IT industry, while your expertise working with data will mean you're well suited to potential PhD study.

In the UK, a machine learning engineer can expect a graduate entry level salary of £35,000.

With three to five years experience, this can rise to £50,000 to £80,0000.

At senior level or in a specialised or lead role, this can rise to £120,000.

source: Prospects, Sept 2024

Career support from day one to graduation and beyond

Career planning

From education to employment

Networking events

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 - £14,000
Year in industry fee - £2,800

International fees

Full-time place, per year - £34,000
Year in industry fee - £6,800

Tuition fees are for the academic year 2026/27.

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

- You can pay your tuition fees in instalments.
- All or part of your tuition fees can be funded by external sponsorship.
- International applicants who accept an offer of a place will need to pay a tuition fee deposit.

If you're a UK national, or have settled status in the UK, you may be eligible to apply for a Postgraduate Loan worth up to £12,167 to help with course fees and living costs. **Learn more about paying for your studies**.

Additional costs

We understand that budgeting for your time at university is important, and we want to make sure you understand any course-related costs that are not covered by your tuition fee. This could include buying a laptop, books, or stationery.

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.

Postgraduate entry requirements

We accept a 2:2 honours degree from a UK university, or an equivalent academic qualification from a similar non-UK institution. This degree should be in computer science or a closely related subject.

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 entry requirements. Completing your Foundation Certificate, such as that offered by the University of Liverpool International College, means you're guaranteed a place on your chosen course.

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

6.5 overall, with no component below 5.5

Duolingo English Test

125 overall, with speaking, reading and writing not less than 105, and listening not below 100. For academic year 2025/26 only, we will also accept the production, literacy, comprehension and conversation score set: 120 overall, with no component below 95.

Pearson PTE Academic

61 overall, with no component below 59

LanguageCert Academic

70 overall, with no skill below 60

PSI Skills for English

B2 Pass with Merit overall and no band below B2 Pass

INDIA Standard XII

National Curriculum (CBSE/ISC) - 75% and above in English. Accepted State Boards - 80% and above in English.

WAEC

C6 or above

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
6.0 overall, with no component below 5.5	6 weeks	On campus or online
5.5 overall, with no more than one component at 5.0	10 weeks	On campus or online
5.5 overall, with no component below 5.0	12 weeks	Online
5.0 overall, with no component below 5.0	20 weeks	On campus
5.0 overall, with no component below 4.5	30 weeks	On campus
4.5 overall, with no more than one component at 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 6.5 overall, with no component below 5.5, for further details.

Back to top