MSc

Applied Statistics and Data Science

Study mode	**Duration**	Apply by: **28 August 2026**
Full-time	12 months	Starts on: **21 September 2026**

About this course

This programme will equip STEM graduates with the ability to apply methods of statistics and data science to solve complex real-world problems across a broad range of fields, from global health and epidemiology to finance and investment. You will acquire the knowledge and skills required to lead innovation and spearhead change in a data-driven world.

Introduction

Every organisation, in every industry, needs to know how to analyse and translate data into meaningful insights, to drive innovation and positive outcomes. The Applied Statistics and Data Science MSc programme will develop your knowledge and skills to enable you to meet the needs of modern society. The MSc will take you from the foundations of data science, statistical models, and stochastic processes to the mastery of contemporary machine learning methods and programming skills. You will learn how to use powerful statistical and data science methods to create systems capable of extracting compelling insights from big data and predicting outcomes in real-world applications.

In semester two, you will develop specialist knowledge in selected areas of applied statistics and data science by choosing one of the following pathways:

- **Global Health and Epidemiology:** This pathway will equip you with a unique set of skills to tackle global heath challenges and optimise responses to epidemiological threats. Modules include Infectious Disease Modelling, Spatial

and Structural Heterogeneity in Infectious Disease Modelling, and Statistics for Epidemiology.

- **Machine Learning for Investment Science:** This pathway will enable you to employ the power of machine learning to understand how to model, predict, and interpret international financial trends and economic forces. Modules include Quantitative Risk Management, Mathematical Finance, and Machine Learning for Finance.

- **Social Finance:** This pathway will equip you with the quantitative and analytical skills to address social challenges through innovative financial strategies. You will explore how mathematical tools and financial models can support sustainable development. You will gain practical insight into designing and implementing impactful solutions through entrepreneurial thinking and innovation. Modules include Mathematics of Social Finance, Quantitative Risk Management, and Entrepreneurial Thinking and Innovation

- **Statistics:** This pathway will provide you with a broad understanding of the applications of statistical methods and machine learning, while also offering a deep dive into the mathematical methods of data science. (This pathway is only suitable for entrants holding a BSc in Mathematics, Theoretical Physics, or equivalent.) Modules include Machine Learning for Finance, Statistics for Epidemiology, and Stochastic Theory and Methods in Data Science.

This exciting and stimulating programme is offered by the Department of Mathematical Sciences and delivered by world-leading experts in their field who are accomplished teachers and researchers, working to tackle real-world problems in epidemiology, financial mathematics, and more! The Department hosts the Mathematics Centre of Enhancement in Education, which supports colleagues to develop innovative teaching methods and ensure that you are taught in the most effective and engaging way.

The degree is expected to be accredited by the Institute of Mathematics and its Applications (IMA)* and Royal Statistical Society (RSS)*.
*Accreditation is pending approval.

Who is this course for?

The MSc is suitable for graduates who have a STEM degree (Science, Technology, Engineering, or Maths) with a significant numerical component.

This MSc is ideal for those wanting to pursue a career in statistics and data science across a broad range of sectors, from global health organisations to governments, financial sector, and food industries.

What you'll learn

- The fundamental concepts in statistical modelling, data science and stochastic processes.

- How to use statistics and data science to create systems that can extract insights from big data and predict future outcomes in real-world applications.

- Effectively communicate with a range of stakeholders.

- Key transferable skills for employability: working in teams, digital fluency, and problem-solving.

In semester 2, you can choose one of the specialist pathways, on which you will develop expertise in a specific area.

- Global Health and Epidemiology Pathway

- Machine Learning for Investment Science Pathway

- Social Finance

- Statistics Pathway

Accreditation

As a new programme, our Applied Statistics and Data Science MSc is pending accreditation by the Institute of Mathematics and its Applications (IMA) and the Royal Statistical Society (RSS). The programme is expected to be fully accredited in 2026, as soon as the first cohort graduates.

Course content

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

Semester one

In semester one you will study the mathematical foundations of data science and statistical models to develop your understanding of applied statistics and be able to choose your specialist pathway for further study in semester two.

Modules

Compulsory modules	Credits
MATHEMATICAL FOUNDATIONS OF DATA SCIENCE (MATH501)	30
STATISTICAL MODELS AND FOUNDATIONS OF STOCHASTIC PROCESSES (MATH502)	30

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

Global Health and Epidemiology Pathway

In semester 2, you can choose one of four pathways: Statistics Pathway, Machine Learning for Investment Science Pathway, Social Finance or the Global Health and Epidemiology Pathway.

Global Health and Epidemiology Pathway:

If you are interested in predicting future global heath challenges and optimising international responses to the next pandemic, choose the Global Health and Epidemiology Pathway.

What you'll learn:

- Different epidemic models (SIR/SIS/SEIR) and how to use these models to generate forecasts.

- Regression and smoothing models for spatial data and simulation of outbreaks on networks.

- Statistical forecasting models for time series data.

- How to evaluate public health impact through appropriate utility functions and target outcomes.

Modules

Compulsory modules	Credits
INFECTIOUS DISEASE MODELLING (MATH531)	20
SPATIAL AND STRUCTURAL HETEROGENEITY IN INFECTIOUS DISEASE MODELLING (MATH532)	20
STATISTICS FOR EPIDEMIOLOGY (MATH533)	20

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

Machine Learning for Investment Science Pathway

In semester 2, you can choose one of four pathways: Statistics Pathway, Machine Learning for Investment Science Pathway, Social Finance or the Global Health and Epidemiology Pathway.

Machine Learning for Investment Science Pathway:

If you are interested in employing the power of machine learning to understand how to model, predict, and interpret international financial trends and economic forces, choose Machine Learning for Investment Science Pathway.

What you'll learn:

- Mean-variance portfolio optimisation and different risk measures for financial applications.

- Computation of default probabilities and loss distributions in credit risk models.

- Finding a fair price of financial derivatives and constructing hedging strategies.

- Unsupervised learning techniques for gaining insight on high-dimensional data.

Modules

Compulsory modules	Credits
QUANTITATIVE RISK MANAGEMENT (MATH561)	20
MATHEMATICAL FINANCE (MATH562)	20
MACHINE LEARNING FOR FINANCE (MATH563)	20

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

Social Finance Pathway

In semester 2, you can choose one of four pathways: Statistics Pathway, Machine Learning for Investment Science Pathway, Social Finance or the Global Health and Epidemiology Pathway.

Social Finance Pathway:

If you are interested in learning mathematical tools and financial modelling techniques to design inclusive financial solutions to support sustainable development, choose Social Finance Pathway.

What you'll learn:

- Apply relevant entrepreneurial and innovation frameworks and tools to tackle real-world challenges faced by start-ups, emerging growth ventures, and established organisations in a global context.

- Design tailored financial products to address the needs of underserved communities, using data-driven insights, statistical testing, and financial model interpretation to address inequality and promote social inclusion.

- Optimise investment decisions through mean-variance portfolio and diverse risk measures, balancing financial and social returns.

- Use advanced risk optimisation techniques to allocate resources efficiently and maximise both financial returns and measurable social impact.

Modules

Compulsory modules	Credits
MATHEMATICS OF SOCIAL FINANCE (Math571)	20
QUANTITATIVE RISK MANAGEMENT (MATH561)	20
ENTREPRENEURIAL THINKING AND INNOVATION (ULMS896)	20

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

Statistics Pathway

In semester 2, you can choose one of four pathways: Statistics Pathway, Machine Learning for Investment Science Pathway, Social Finance or the Global Health and Epidemiology Pathway.

Statistics Pathway:

For a deep dive into the mathematical methods of data science as well as to acquire a broad understanding of the applications of statistical methods and machine learning, choose Statistics Pathway. (Please note, this pathway is only suitable for entrants holding a BSc in Mathematics, Theoretical Physics, or equivalent.)

What you'll learn:

- Broad understanding of the applications of statistical methods and machine learning.
- Deep dive into the mathematical methods of data science.

Modules

Compulsory modules	Credits
STATISTICS FOR EPIDEMIOLOGY (MATH533)	20

Compulsory modules	Credits
MACHINE LEARNING FOR FINANCE (MATH563)	20
STOCHASTIC THEORY AND METHODS IN DATA SCIENCE MSC (MATH568)	20

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

Final project

You will undertake your research project over the summer. You will work in groups or individually on research topics or industrial problems in applied statistics and data science. The project might involve working with industrial partners where appropriate.

Modules

Compulsory modules	Credits
CAPSTONE PROJECT (MATH556)	60

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

Teaching and assessment

How you'll learn

We are proud of our record on teaching quality. Our MSc consists of innovative mathematics modules delivered by world-renowned experts. We use a range of teaching methods, including 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, assignments, individual and group projects, or online exercises with automatic marking and immediate feedback. The programme also includes dissertation modules assessed through independent and group project work.

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.

Careers and employability

Studying Applied Statistics and Data Science will equip you with the ability to analyse, interpret, and act on data, making you a key player in today's data-focused world.

Whether you are interested in global health and epidemiology or finance and investment, these skills are essential for driving innovation and making informed decisions.

Data scientists, statisticians, and data analysts are in high demand and are offered rewarding salaries due to the critical role they play in organisations.

A career in data science offers you the opportunity to solve complex problems, unlock valuable insights, and drive impactful decisions across diverse industries, all while being at the forefront of technology and innovation.

Applied statistics and Data Science knowledge and skills are sought after in many sectors such as agriculture, economics, education, engineering, medicine, and transport.

Typical employers include:

- Financial and banking companies
- Insurance and accountancy firms
- Retail and e-commerce
- IT companies
- Logistics and transport companies
- NHS and private health companies
- Government organisations
- Market research organisations
- Pharmaceutical and healthcare industry
- Universities and other education bodies.

Sectors such as telecom, oil and gas, and sports and fitness are increasingly using statistics and big data for planning and decision-making.

Career support from day one to graduation and beyond

Career planning

From education to employment

Networking events

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 - £13,300

International fees

Full-time place, per year - £29,900

Fees stated are for the 2025/26 academic year. Tuition fees for the academic year 2026/27 will be announced soon.

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.

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 a STEM subject (Science, Technology, Engineering, or Maths) with a significant numerical component.

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

TOEFL iBT

88 overall, with minimum scores of listening 19, writing 19, reading 19 and speaking 20

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 65

PSI Skills for English

B2 Pass with Merit in all bands

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
5.5 overall, with no component below 5.5	10 weeks	On campus and online options available
5.5 overall, with no more than one component below 5.5, and no component below 5.0	12 weeks	On campus and online options available
5.5 overall, with no component below 4.5	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 below 4.5, and 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 6.5 overall, with no component below 5.5, for further details.

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