

Data Science MSci (Hons)

UCAS Code: DS54 | **Duration: 4 years** | **Full-time** | **Hope Park** | **2024/2025**

Placement year opportunities available | Study Abroad opportunities



Course Overview

Recent advances in computational power, machine intelligence and the huge growth in sources of data has led to the development of a relatively new area of Data Science.

Almost every communication or interaction that takes place involves a digital interface, whether this is a computer, a laptop, a cell phone, a smartcard, a camera or a sensor. All of the information from these interactions is stored as data, which can be mined to make better decisions, better systems, and better research. This course has a specific focus on areas such as Big Data, Numerical Analysis, Cloud Computing, Statistics & Statistical Programming, Artificial Intelligence, Internet of Things, Mobile Computing and High-Performance Computing.

Entry Requirements

This course follows the standard University entry requirements. Please see the website for further information.

Applicants will need access to a computer if course delivery is switched to online. The University has a laptop lending service if remote study is necessary.

Fees and Additional Costs

The tuition fees for 2024/2025 are £9,250 for full-time undergraduate courses.

If you are a student from the Isle of Man or the Channel Islands, your tuition fees will also be £9,250. The University reserves the right to increase Home and EU Undergraduate and PGCE tuition fees in line with any inflationary or other increase authorised by the Secretary of State for future years of study.

You will also need to consider the cost of your accommodation each year whilst you study at university.

Visit our accommodation webpages for further details about our Halls of Residence:
www.hope.ac.uk/halls



**LIVERPOOL
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Curriculum

Year One

Your first year of study will be a broad introduction to Data Science with a focus on developing the theoretical knowledge, problem solving and practical skills that underpin Data Science. In addition, the following fundamental topics will be covered:

- Mathematical Thinking: Logic, proofs, numbers, set theory
- Calculus
- Complex Numbers
- Differential Equations
- Linear Algebra
- Statistics
- Introduction to mathematical and statistical programming
- Introduction to software engineering: algorithm design, programming, source control, documentation
- computational methods
- Database technology

Year Two

In your second year, you will develop a broader understanding and knowledge of the theoretical and practical aspects of Data Science, reflecting on more specialist areas within the discipline. Specific topics will be covered in greater depth with an emphasis on topics such as:

- Multivariable Calculus
- Further Linear Algebra
- Number Theory with applications to Coding Theory
- Differential Geometry
- Further Statistics
- R programming
- Probability
- Graph Theory & Discrete Mathematics
- Software development
- Networks

Year Three

Your third year helps you develop a deeper understanding of the theoretical aspects of Data Science and be able to critically select appropriate tools and techniques to solve problems. Topics will depend on latest developments but will include areas such as:

- Statistical Modelling
- Network Science
- Semantics / Knowledge Representation
- Numerical Analysis
- Machine Learning and AI
- High Performance Computing
- Computer Vision
- Cloud Computing
- Game Technology
- Big Data
- Natural Language Processing

Year Four

In your final year you will be studying with a great degree of autonomy with a focus on preparation for industry and Chartered Engineer (CEng) registration. The Curriculum will be focused on applications of material that has been covered in prior years in a professional context, reflecting latest developments in data Science and will include topics such as:

- Neural networks (Machine learning)
- Advanced algorithm design
- Data structures
- Advanced statistical modelling
- Topological data analysis
- Deep learning

COURSE STRUCTURE

Teaching on this degree is structured into lectures, where all students are taught together, seminars of smaller groups of around 15-20 students, and tutorials which typically have no more than 10 students. During your first year of study, there are approximately 12 teaching hours each week, which reduces to approximately 10 teaching hours in your second and third years. On top of teaching hours, you are also expected to spend a number of hours studying independently each week, as well as studying in groups to prepare for any group assessments that you may have.

ASSESSMENT AND FEEDBACK

During your degree, there are a variety of assessment types to ensure you are given a range of opportunities to demonstrate your knowledge, skills and understanding of the academic and professional components of the degree. These include written exams, portfolios of tasks and activities, and practical coursework. In your final year, there is also a dissertation or extended research project to complete. You will be given written feedback on your assessments, and you will have the opportunity to discuss this with your tutor in more detail.



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