Mathematics BSc (Hons)

UCAS Code: G100 | **Duration: 3 years** | **Full-time** | **Hope Park** | **2024/2025**

Accredited | Placement year opportunities available

Course Overview

Mathematics is a fascinating and exciting subject. It is the language of modern Business and Commerce, Engineering, Science and Technology and is as old as mankind. At Liverpool Hope, you will develop a passion and enthusiasm for mathematics and its applications. Mathematics encompasses many analytical and numerical methods that are used to solve scientific and industrial problems.

Mathematics at Liverpool Hope has been designed to help you develop strong analytical and numerical abilities and skills so that you learn how to look at problems, break them down into simpler questions and then solve them. Mathematics at Liverpool Hope can be taken as a single honours degree or a combined honours degree with a related subject.

The degree will cover all areas of mathematics including pure mathematics, applied mathematics and statistics. By the end of the degree, you will be confident in tackling real world problems mathematically. By studying with us, you can expect to be given not only first class tuition and teaching, but first class support. We pride ourselves on providing an excellent student experience, and the academics at Liverpool Hope work hard to ensure that you get the most from your degree.

Entry Requirements

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

Fees and Additional Costs

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

As well as your tuition fees, you need to consider the cost of books, software, and general computer consumables such as USB flash drives and printing. We estimate this to cost around £300.

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**

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.

Accreditation

This Single Honours BSc degree has been accredited by the Institute of Mathematics and its Applications. This degree will meet the educational requirements of the Chartered Mathematician designation, awarded by the Institute of Mathematics and its Applications, when it is followed by subsequent training and experience in employment to obtain equivalent competences to those specified by the Quality Assurance Agency (QAA) for taught masters degrees.

LIVERPOOL HOPE UNIVERSITY
1844

Institute of mathematics & its applications

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Mathematics BSc (Hons) Curriculum

Year One

Introduction to Mathematics (Core 1)

The purpose of this course is to cover the fundamentals of mathematics that a new undergraduate should know.

Set theory, Logic, Numbers and proofs

This part of the course is aimed to get students thinking mathematically.

Calculus

Although this is studied at school, we take a different approach to calculus and look at this as the study of functions and the way they behave.

Complex numbers

This topic is based around the square root of one, which we call the imaginary number.

Linear algebra

We begin this topic by looking at vectors and matrices before looking at how we can use such properties to solve several equations at once.

Statistics, probability and combinatorics

Being able to effectively deal with data is a prerequisite for most scientific-based employment.

MATLAB & programming

Modern mathematicians are expected to know some programming and we introduce students to the basics of structured problem solving.

Those doing single honours will also study:

- Mathematical modelling
- Application of mathematics
- Difference equations
- Ordinary differential equations
- Graph theory
- Financial Mathematics
- Mathematical communication

Year Two

Explorations in Mathematics (Core 1)

With the fundamentals covered at Year 1, we keep the Year 2 topics quite broad but start to focus in on some areas of mathematics.

Multivariable calculus

We extend the calculus covered at year 1 to include functions of several variables.

Differential geometry

In this topic, we look at some geometrical techniques that utilise calculus.

Linear algebra

We extend the linear algebra topics covered in first year and look at vector spaces, matrix factorisation and applications of linear algebra.

Statistics & R programming

Expanding on topics covered in year 1, we look at distributions, regression analysis, and a variety of statistical test including chi squared, ANOVA, and t-tests.

Number theory & Abstract Algebra

Number theory is a vast area of mathematics, and we look at a small part of it and its applications to cryptography.

Those doing single honours will also study:

- Systems of ordinary differential equations
- Partial differential equations
- Laplace transformation
- Fourier analysis
- Numerical analysis
- Difference Equations

Year Three

Advanced Studies in Mathematics (Core 1)

In year 3, we study topics that are at the forefront of the research interests of the staff currently teaching on the programme.

Statistics methods

Building up from the statistical methods learnt in the first two years, we look at the some practical applications in the real world.

Mathematical Physics

We start by defining quantities known as Lagrangian and Hamiltonian, and we show how the Euler-Lagrange equations emerge naturally from the least-action principle.

Group theory

Group theory is an important subject in mathematics that deals with algebraic structures known as groups.

Complex analysis

A complex function is a mapping from the complex numbers to the complex numbers.

Those doing single honours will also study:

- Symmetries of differential equations
- Hamiltonian
- Chaos theory
- Perturbation methods
- Research Projects and Dissertations.

All students will undertake project work either as a research project (for combined students) or as a dissertation (for single honours students).

COURSE STRUCTURE

Teaching on this degree is structured into lectures, seminars and tutorials.

If you are studying Mathematics as a Single Honours degree, in 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. If you are studying Mathematics as a Combined Honours degree, in your first year of study there are approximately 6 teaching hours each week, which reduces to approximately 5 teaching hours in you 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 you may have.

ASSESSMENT AND FEEDBACK

There are a number of assessments across your three years of study, including written exams, portfolios and coursework.

You will be given feedback on your assessments, and you will have the opportunity to discuss this with your tutor in more detail.