

A Level Further Mathematics

Overview:

Exam Board: Edexcel

Around a third of Mathematics BSc degree courses mention Further Mathematics in their entry requirements, either as a requirement or as desirable.

Taking A level Further Mathematics is an excellent way to prepare students for a degree in Mathematics and other subjects that contain degree-level maths content. This is because it introduces students to a wide range of pure and applied content, such as matrices and complex numbers.

It is particularly relevant to those going on to study physics and engineering at university, as degrees in those subjects will likely include mathematical content which further mathematics gives a head start in.

Content:

The course will consist of 50% additional Pure Mathematics ("Core Pure"), which is mandatory content, and two additional units worth 25% each. We currently offer Further Statistics and Decision Mathematics as the two additional units, although this is subject to change at the school's discretion.

Core Pure Mathematics

Students develop an understanding of the rigour and technical accuracy needed for more advanced study of mathematics, and look at advanced areas such as matrices, complex numbers and differential equations.

Topics in Y12:

- Proof
- Matrices
- Complex Numbers
- Polynomial Roots and Maclaurin Series
- Further Calculus
- Volumes of Revolution
- Vectors in 3D
- Polar Coordinates
- Hyperbolic Functions
- Differential Equations

Further Statistics

Students develop a wider range of statistical tools and models which can be applied to practical scenarios, and develop the ability to select and evaluate appropriate hypothesis tests.

Topics:

- Discrete Probability Distributions
- Poisson and Binomial Distributions
- Geometric and Negative Binomial Distributions
- Hypothesis Testing
- Central Limit Theorem
- Chi Squared Tests
- Probability Generating Functions

Decision Mathematics

Students gain experience of modelling and of the use of algorithms in a variety of situations.

Topics:

- Algorithms
- Graph Theory
- Minimum Connectors and Shortest Paths
- Critical Path Analysis
- Linear Programming

Entry Requirements:

Normal entry requirements with GCSE Mathematics at Grade 7 or above.

A very good understanding of all GCSE Algebra topics is expected.

How Assessed:

Four exams at the end of Y13:

Paper 1 (75 marks, 90 minutes) is **core pure mathematics**, and can assess any Y12 and Y13 content.

Paper 2 (75 marks, 90 minutes) is also **core pure mathematics**, again assessing Y12 and Y13 content.

Paper 3 (75 marks, 90 minutes) is **further statistics**, and can assess any Y12 and Y13 content.

Paper 4 (75 marks, 90 minutes) is **decision mathematics**, and can assess any Y12 and Y13 content.

There is no coursework.

Progression:

Further Mathematics is ideal for students who are planning to go on and do a degree in Mathematics at University. Content in the Further Mathematics course also comes up in degrees in Physics and Engineering, so it can also give you a head-start in these disciplines. It can also be a preferred A-level in almost any BSc subject, including Chemistry, Biology, Geography, Sociology and Psychology.