

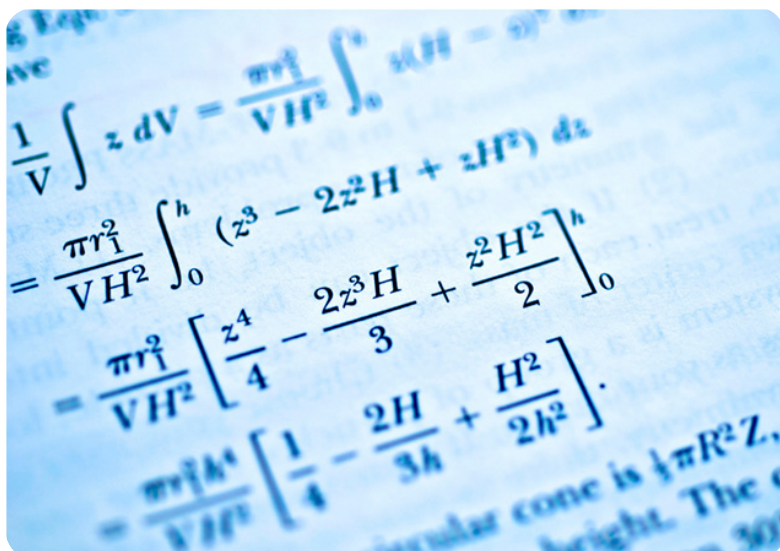
Further Mathematics

A Level

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Exam Board: AQA



What is the course about?

The course consists of 12 modules - 8 Pure Maths, 2 Mechanics and 2 Statistics.

Pure Maths is the study of mathematical ideas and methods for their own sake and to give a "toolkit" for solving mathematical problems. All Pure Maths is expressed in terms of algebra. In addition to Pure Maths you study two applications of Maths – Statistics and Mechanics. Statistics involves learning how to draw conclusions from data. It is very different from Statistics at GCSE and focuses on probability. Mechanics involves using Maths to describe the motion of objects and how they respond to forces acting on them - from cars in the street to satellites revolving round a planet. It includes topics such as energy and collisions.

For the first year you will study:

In the first year you study four modules of Pure Maths and two application modules.

For the second year you will study:

In the second year you study a further four Pure Maths modules and a further two applications modules.

How is the course assessed?

Twelve 1 hour 30 minute module exams - 6 in the first year, 6 in the second year.

There is no coursework.

Do you need Further Maths to take Maths at university?

Further Maths is needed in order to take Maths at the most competitive universities. It is also more or less necessary for Physics, Engineering and Computer Science, and highly desirable for Chemistry too.

What does Further Maths include that is not in ordinary Maths A level?

The additional topics in Pure Maths include

- Imaginary numbers - How negative numbers can have square roots and what the consequences are. This is the basis of chaos theory and is unexpectedly useful in electrical engineering.
- Maclaurin's Series - The Maths behind how values of sin, cos and tan are found.
- Linear Algebra - The Maths behind how a computer can solve 102 simultaneous equations in 102 unknowns as easily as you can solve 2 equations in 2 unknowns.
- Second order differential equations - The Maths behind why bridges wobble dangerously if people walk across them at a critical speed.

The additional topics in Mechanics include

- The Maths behind bungee jumping
- How planets go round the sun

The additional work in Statistics and Probability includes, among other things, looking at the Maths behind how casinos ensure they almost always make a profit (and gamblers almost always make a loss!).

What are the formal entry requirements for this course?

Aside from the general entry criteria that the College requires, you will also need to achieve at least GCSE Maths grade A or A*. The approach and pace reflect the fact that most Further Maths students will have achieved mainly A's or A*'s in their GCSE's across the board. However, if you get an A or A* in GCSE Maths, taking two A levels in Maths should be easier than taking two separate A levels in two separate subjects, because the various parts of the subject reinforce each other.

What extra support / enrichment activities are on offer?

There is the opportunity to take part in the United Kingdom Maths Trust's Senior Maths Challenge and to take part in team based Maths competitions locally. We have also introduced the opportunity to take the Advanced Extension Award in Mathematics.

What are the benefits of taking Further Maths?

You go deeper into the theory of Maths.

- You learn the material in a more challenging and deeper way.
- You work alongside other good mathematicians.
- You develop greater maturity as a mathematician because you have more experience of solving problems and thinking mathematically.
- Doing Further Maths can help clinch a grade A in ordinary A level Maths. To a large extent the standard for grade A is set by Further Maths students and it is more difficult to achieve this standard without taking Further Maths.
- Will you already have taken modules of A level Maths? Or the Additional Maths qualification? If so, taking Further Maths means you get onto new ideas more quickly than on the ordinary A level Maths course.

What can the course lead to in terms of higher education and future careers?

Further Maths gives the strongest possible background for Maths based university courses such as Mathematics, Physics, Engineering, Computer Science and straight Chemistry degrees.



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