

# Further Mathematics A Level

## Course Overview:

### Unit 1 Further Pure Mathematics 1 – Pure Mathematics

This course includes an introduction to the imaginary number  $i$  and the study of complex numbers including solving quadratic, cubic and quartic equations and constructing loci in the argand diagram.

Content: proof, complex numbers, matrices, further algebra and functions, further calculus and further vectors.

### Unit 2 Decision Mathematics 1 – Applied Mathematics

Decision Mathematics is a relatively new discipline that is concerned with modelling and interpreting situations, using algorithms, networks and linear programming to find efficient solutions to problems. It has significant applications to computer programming and business models. Content: algorithms and graph theory, algorithms on graphs, algorithms on graphs II, critical path analysis and linear programming.

### Unit 3 Further Pure Mathematics 2 - Pure Mathematics

For this paper, you will study the application of complex numbers including de Moivre's theorem, to find multiple angle formulae and sums of series. You will learn to use partial fractions to sum series and meet the Maclaurin series of a function. This is a paper for Mathematicians who love a challenge. Content: further complex numbers, further algebra and functions, further calculus, polar coordinates, hyperbolic functions and differential equations.

### Unit 4 Further Mechanics 1 - Applied Mathematics

This unit further develops the Mechanics taught for A Level Mathematics. We introduce momentum, impulse and collisions including Newton's law of restitution and successive impacts. This course is excellent preparation for engineering and applied Science courses. Content: momentum and impulse, collisions, centres of mass, work and energy and elastic strings and springs.

## Assessment:

Paper	Weight	Marks
Further Pure Mathematics 1	25%	75
Decision Mathematics 1	25%	75
Further Pure Mathematics 2	25%	75
Further Mechanics 1	25%	75

## Why would this course suit me?

This course is taken in addition to A Level Mathematics, and is for students who enjoy Mathematics, and who have reached an excellent standard in the subject. This is a course for keen Mathematicians who wish to extend and deepen their studies in Mathematics. Due to the academic rigour of the course, it is highly regarded by Universities and employers.

## How does this course link to other subjects?

For this course, it is a requirement that you also study Mathematics A Level. The following subjects complement the study of Mathematics: Physics, Chemistry, Biology, Economics, Business Studies, Geography, Computer Science, Design and Psychology.

**Examination Board:**  
Edexcel

**Entry Requirements:**  
Grade 7 in Mathematics

## Potential Career Opportunities:

Further Mathematics is extremely well-regarded by both Universities and employers. The Russell Group of Universities name Further Mathematics among its list of 'facilitating subjects'.

Further Mathematics is excellent preparation for a wide range of areas of study at University, such as Mathematics, Science, Engineering, Finance, Medicine, Economics and Computing courses.

Further Mathematics leads onto a wide range of careers including Computer Science, Biochemical Sciences, Natural Sciences, Engineering, Medical Sciences, Psychology, Statistics, Economics, Accountancy, Management and Actuarial Science.

