Further Mathematics

Why study this course?

This course is studied alongside Mathematics A level and is ideally suited for those students with a genuine love of solving challenging problems and who intend studying Mathematics, Physics, Engineering or Programming at university.

What specific skills will I learn?

You will be introduced to advanced concepts and techniques, such as complex numbers, matrices and vectors, and how they relate to real life applications. You will also cover a relatively new branch of Mathematics (investigating algorithms, game theory and critical path analysis) which is used widely in industry.

What career paths could this course lead to?

An A level in Further Mathematics can lead into a number of different career paths. Students go on to study Mathematics at university, but others opt for courses with a large amount of mathematical content, such as Physics or Engineering. More than this, employers value a qualification in Mathematics as it demonstrates a logical and analytical approach to solving problems.

"The careers advice I received was invaluable in helping me make the right choices"

"I became the person I am now because of my experiences and time at Sandbach College"

Sandbach College

www.sandbachcollege.co.uk

T: 01270 765031

How is the course structured?

The course is made up of 50% core content and 50% optional; the optional content will be Decision Mathematics (Year 1) and Further Pure Mathematics 1 (Year 2).

The core content extends the work studied in the Pure content of the Mathematics A level. Topics include proof, complex numbers, matrices, further algebra and functions, further calculus, further vectors, polar coordinates, hyperbolic functions and differential equations .

Decision Mathematics examines many algorithms that are used to solve real-world problems such as 'What is the shortest route that gets me from A to B?' or 'What is the most efficient way of delivering goods to 8 towns?' Critical path analysis will show how to model a project using precedence tables, resource histograms and schedules for activities so human resources are used to the best effect in completing a project. Finally, linear programming introduces us to the Simplex algorithm and the big-M method for maximising and minimising problems with $\leq$ or $\geq$ constraints.

Further Pure Mathematics 1 continues to extend and challenge students with topics such as trigonometry, calculus, differential equations, coordinate systems, numerical methods and vectors.

At the completion of the A Level course (Year 13) the student will sit 4 papers

- Paper 1 – Pure content (1 hour 30 minutes, 75 marks)

- Paper 2 – Pure content (1 hour 30 minutes, 75 marks)

- Paper 3A – Further Pure Mathematics 1 (1 hour 30 minutes, 75 marks)

- Paper 4D – Decision 1 (1 hour 30 minutes, 75 marks)

Each paper is worth 25% of the overall mark.

Extra opportunities

A level Mathematics students can attend external lectures, visit university departments, work with younger students in class and in clubs to develop their confidence in mathematics, support an EPQ with a mathematical focus and prepare for university entrance exams.