Further Mathematics

Further Mathematics A-Level is designed for the very brightest and most able Mathematicians - you must have a love of Mathematics and be prepared to tackle challenging and demanding problems. The mathematics and the skills that you learn will prepare you excellently for future study in any mathematical related field and prepare you to study at the most highly selective universities. Further Mathematics A-Level is an extension of A-Level Mathematics, and you must take A-Level Mathematics alongside A-Level Further Mathematics to access the course.

Entry Requirements

Grade 6 in GCSE Mathematics

Topics covered

CORE PURE MATHS	FURTHER MECHANICS	DECISION MATHEMATICS
Proof	Momentum and Impulse	Algorithms and Graph Theory
Complex Numbers	Work, Energy and Power	Algorithms on Graphs
Matrices	Elastic strings and springs and elastic energy	Algorithms on Graphs II
Further Algebra and Functions	Elastic Collisions in 1 dimension	Critical Path Analysis
Further Calculus	Elastic Collisions in 2 dimensions	Linear Programming
Further Vectors		
Polar Coordinates		
Hyperbolic Functions		
Differential Equations		

Skills you will develop on the course

- Problem-solving
- Critical thinking
- Quantitative Reasoning
- Analysing and interpreting data

Assessment

Students will sit 4 exam papers at the end of year 13 which will count for 100% of their overall mark.

- Paper 1: Core Pure Maths, 75 marks, 90 minutes.
- Paper 2: Core Pure Maths, 75 marks, 90 minutes.
- Paper 3: Further Mechanics, 75 marks, 90 minutes.
- Paper 4: Decision Mathematics, 75 marks, 90 minutes.

Educational trips, visits and wider experiences

- We will organise trips to universities, such as the University of Warwick, where students have the opportunity to attend Maths workshops and visit the maths department.
- Students have chance to enter national mathematics competitions such as the Senior Maths Challenge and Maths Olympiad for Girls.
- Students have the chance to enrol in regular problem-solving classes at the University of Warwick which will help prepare them for competitive university entrance test such as STEP, TMUA, or the MAT.

What type of students will do well on this course?

Students who love mathematics and are really excited about having 10 hours of Maths and Further Maths lessons a week. You most love getting stuck into difficult problems, and be determined to find solutions.

For more information contact:

Ms Doherty - Head of Maths
doherty@pks.coventry.sch.uk

Mr Hodson - Post Holder KS5 Maths
hodson@pks.coventry.sch.uk

Post-School Progression Opportunities

University	Entry requirements	Other similar courses offered
University of Bath Mathematics BSC (Hons)	A*AA including A*A in Mathematics and Further Mathematics	Other similar courses offered: Mathematics MMath, Mathematics and Statistics BSc, Mathematics Statistics and Data Science BSc
University of Cambridge, Kings College Computer Science Meng	A*A*A including Mathematics and Further Mathematics, and TMUA admissions assessment	Engineering MEng, Mathematics MMath, Natural Science MSci
University of Warwick, Mathematics, Operational Research, Statistics, Economics (MORSE), BSc	A*A*A to include A*A* in Mathematics and Further Mathematics	Data Science BSc, Mathematics and Statistics BSc, Discrete Mathematics BSc

Career Opportunities

Actuary

What would I do?

- Use mathematical modelling techniques and statistical concepts to determine probability and assess risks, for example, analysing pension scheme liabilities to price commercial insurance
- Analyse statistical data in order to make calculations, for example, accident rates for particular groups of people
- Be an effective communicator, to discuss and explain complex topics in a simple way
- Present reports, explaining their implications to managers and directors and advising on risk limitation

Salary: Starting: £30,000
UK average: £55,000
Routes in: Relevant Bachelor's degree

Research Scientist Maths

What would I do?

- Use specialist mathematical software such as Mathematica, MATLAB or Mathcad or programming languages such as C/C++ to develop programs to perform mathematical functions
- Produce original mathematics research
- Identify solutions by learning and applying new methods, for example designing mathematical models that interpret data in a meaningful way
- Attend, and sometimes present at, national and international scientific conferences and meetings in your particular field of interest

Salary: Starting: £15,000
UK average: £35,000
Routes in: Relevant Bachelor's degree and PhD

Operational Researcher

What would I do?

- Collect and analyse data and develop models, often using spreadsheets, databases and pragmatic, numerical approaches to solve problems
- Use analytical methods, such as simulation, network analysis, decision analysis, multi-criteria analysis, scenario analysis, soft-systems modelling, optimisation, game theory and queuing theory
- Compile a report of findings and make presentations to clients, often requiring clear and persuasive explanation of complex processes to a non-technical audience, in order to help them make decisions

Salary: Starting: £24,000
UK average: £50,000
Routes in: Relevant Bachelor's degree and PhD