



# FURTHER MATHEMATICS

Exam Board: Welsh Joint Education Committee (WJEC)

Staff: 8 full time teachers, 2-part time teachers, 1 January start dedicated teacher, 1 published specialist STEP teacher.

All teaching staff are qualified Mathematics teachers with many years of experience, including work as Heads of Department and examiners.

Summary: A two year A Level course, examined at the end of Year 13

## **What do I need to know before taking Further Maths at A Level?**

You will need to get at least an A (preferably an A\*) in Mathematics GCSE (or equivalent). Having strong basic algebraic and numerical manipulation skills (factorising, dealing with fractions, solving equations) is **ESSENTIAL**. Effective communication in English will also be required. You will require a Casio FX991EX Classwiz Advanced Scientific Calculator for this course.

## **What will I learn?**

Further Maths is a highly valued, prestigious and demanding qualification. There is an emphasis in the specification on not just learning the abstract concepts in Mathematics, but their application in real life situations too.

Students will be able to:

- Develop the ability to reason logically
- Extend their range of mathematical skills and techniques and use them in more difficult, unstructured problems
- Recognise how a situation may be represented mathematically and understand the relationship between 'real world' problems and standard and other mathematical models

## **What kind of student is the course suitable for?**

- Students who have a sound approach to individual learning, are motivated and are willing to work hard, as the course is fast paced and challenging
- Students who are planning to study a university course where Further Mathematics is required
- Please be aware that students who wish to study Medicine at university will be advised not to study Further Mathematics



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## Specification content:

### Year 1:

- Mathematics Unit 1- Pure A (algebra, coordinate geometry, vectors, calculus, trigonometry, logarithms)
- Mathematics Unit 2- Applied Mathematics A  
Statistics: discrete distributions, statistical sampling and data presentation, probability.  
Mechanics: kinematics, forces, and Newton's Laws.
- Mathematics Unit 3- Pure B (calculus, trigonometry, algebra, numerical methods, functions, sequences and series)
- FM Unit 1 – Pure A (Proof; Complex Numbers; Matrices; Further Algebra and Functions and Further Vectors)

### Year 2:

- Mathematics Unit 4\*- Applied Maths B. Statistics: hypothesis testing, continuous and discrete distributions. Mechanics: kinematics, non-perpendicular forces, differential equations.
- FM **Unit 2**- Further Statistics A (Random Variables and the Poisson Process and exploring relationships between variables and goodness of fit of a model)
- FM **Unit 3**: Further Mechanics A (Momentum and Impulse; Hooke's Law, Work, Energy and Power; Circular Motion and Differentiation and Integration of Vectors)
- FM **Unit 4**: Pure B (Complex Numbers; Further Trigonometry; Matrices; Further Algebra and Functions; Further Calculus; Polar Coordinates; Hyperbolic functions and Differential equations)  
EITHER
- FM **Unit 5**: Further Statistics B (Samples and Populations; Statistical Distributions; Hypothesis Testing and Estimation) OR
- FM **Unit 6**: Further Mechanics B (Rectilinear motion; Momentum and Impulse; Moments and Centre of Mass; Equilibrium of Rigid Bodies and Differential Equations)

## BMAT and entrance test preparation

For those undertaking BMAT or other entrance tests, support and preparation classes are provided once a week during the Autumn term for the Maths and logic parts of these exams.