Further Mathematics A Level

Course Description:

The Edexcel A Level Further Mathematics courses enable you to deepen your mathematical understanding, particularly through the further pure mathematics. The course also widens your mathematical understanding by studying in greater depth the applied mathematics. Although challenging, students taking further mathematics find it to be an enjoyable, rewarding, stimulating and empowering experience.

The course consists of two main branches of mathematics – Core Pure and Further Mechanics.

At its highest, A Level Further Mathematics presents a substantial quantity of mathematics that is taught in the first year of a university course.

Qualifications Required:

Minimum entry requirements apply. A strong Grade 7 in Maths. Further Maths is taken alongside A level Maths, so this will take up 2 options at A level. Edexcel specification recommends that students have the skills and knowledge associated with the Level 2 Certificate in Further Mathematics or equivalent although many students starting the A Level at Mark Rutherford do not have this qualification. However, you should have a real enjoyment of the subject and a clear aptitude for mathematics. In particular, you need to be very confident with the problem solving aspect and the algebra content of the GCSE course.

Aims of the Course:

- To develop your understanding of mathematics and mathematical processes
- To develop your ability to reason logically, to generalise, to construct mathematical proofs and produce clear and concise solutions to questions
- To extend your range of mathematical skills and techniques and use them in more difficult, unstructured problems
- To develop an understanding of coherence and progression in mathematics and of how different areas of mathematics can be connected
- To recognise how a situation may be represented mathematically and understand the relationship between 'real world' problems and standard and other mathematical models and how these can be refined and improved
- To read and comprehend written mathematics and use mathematics as an effective means of communication
- To show perseverance in answering challenging problems which may require several visitations before a solution is found
- To develop an awareness of the relevance of mathematics to other fields of study, to the world of work and to society in general

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Features of the Course:

- Plan and interpret information from different sources
- Carry out multi-stage calculations and be able to form extended lines of reasoning
- Present findings, explain results and justify choice of methods
- Spiritual, moral, ethical social and cultural issues relating to mathematics

AS Content

Core Pure 1

Complex Numbers, Four operations, Roots of Polynomials, Argand diagrams, Loci, Matrices and Transformations, Determinants and Inverses in 2D, Invariant points and lines, Functions and Algebra, Calculus with Volumes of Revolution, Vectors, Scalar and Vector Product, Polar Coordinates, Hyperbolic Function Definitions

Further Mechanics 1

Introduction to Dimensional Analysis, Momentum and Collisions, Work, Energy and Power, Circular motion

A Level Content

Core Pure 2

Proof by Induction, Complex Numbers, Matrices and Transformations, Solutions of Linear Equations, Determinants and Inverses in 3D, Eigenvalues and Eigenvectors, Maclaurin Series, Calculus, Polar Coordinates, Hyperbolic Functions, Differential Equations, Trigonometry, Coordinate Geometry, Numerical Methods

Further Mechanics 2

Momentum and Collisions, Work, Energy and Power, Circular motion, Centre of Mass and Moments

Methods of Assessment:

A2 Course: There are four papers overall, two papers consisting of Core Pure, and the other papers consisting of two Further Mechanics papers. These areas are each assessed by a 1.5 hours written paper at the end of the course.