

Mathematics AS/A level

Introduction

The study of Mathematics at advanced level is interesting, enjoyable and challenging.

Those who qualify in mathematics are in the fortunate position of having a wide variety of career choices. The abilities to use logical thought, to formulate problems in a way which allows for decision making and computation, are sought after in many different types of employment. An A level in Mathematics, or even an AS in mathematics can help you develop these skills. It is for this reason that mathematicians are increasingly in demand. With a Mathematics qualification, you should be able to turn your hand to finance, statistics, engineering, computing, teaching or accountancy to name a few.

Year 1

In the first year you will study three modules: **Core Mathematics** (C1 & C2) and either **Decision Maths**(D1) or **Mechanics** (M1). In the two core modules (C1 & C2) knowledge and understanding of the topics studied at GCSE are further developed and enhanced. It is therefore crucial for you to have studied successfully all the Higher tier topics at GCSE. You will extend your skills and understanding of topics including algebra, trigonometry and geometry. In addition you will work on analysing number sequences and begin work on calculus; both differentiation and integration – you will develop those skills to enable real-life problem solving. For example, what is the minimum quantity of metal needed to make a tin of baked beans.

Decision Maths module includes Mathematical modelling using Graph Theory, solving network problems using algorithms and Linear Programming. You will encounter real-life situations such as finding the shortest route between two towns; finding the quickest time to visit many cities; business related problems involving maximising profits and minimising costs.

Mathematical models can be used in **Mechanics** to make predictions about real-life situations. You will use Newton's equations of motion, consider the types of forces acting upon objects and study the principle of conservation of momentum. We recommend physics students take this module.

The D1 or M1 exam will be examined in January. C1 (non-calculator) and C2 are examined in Summer.

Year 2

In the second year, you will build on and study in greater depth the skills and knowledge you developed in the first year; extending your work on algebra, calculus, trigonometry and geometry. Additionally, you will be introduced to Vector analysis, exponential and logarithmic functions and the Binomial series. You can choose to study D2 or S1. The decision maths module D2 continues to investigate strategies to solve real-life problems in the fields of manufacturing and business studies using Critical Path Analysis, Dynamic Programming and Network flow analysis.

The applied exam examination will be taken in January and C3 & C4 in the summer.

Further Maths

If you are particularly interested in mathematics and you are good at it, you could consider studying Further Maths at either AS or A level? This will include Further Pure modules, Statistics and Mechanics. This course is advantageous if you are considering studying Maths or a related subject at University. Assessment

Each module is assessed by a 1½ hour exam

Specific Entry Criteria

A Level Maths - Grade **B** in Maths

Further Maths - Grade **A** in Maths (preferably with a strong GCSE Profile)