

MATHEMATICS

AT ADVANCED LEVEL (A/S AND A2)

Our Course: **OCR**

Summary of Subject Content

Pure Mathematics courses concentrate on the development of algebraic skills and other techniques. Applied Mathematics divides into two main areas, Mechanics and Probability and Statistics. In each, students are introduced to a number of models used to solve problems.

First Year

- AS:** Module 1: C1 – Indices and surds, Polynomials, Differentiation, Co-ordinate geometry and graphs.
Module 2: C2 – Trigonometry, Sequences and series, Algebra, Integration.
Module 3: S1 – Representation of data, Probability, Discrete random variables, Bivariate data.

Second Year

- A2:** Module 4: C3 – Algebra and functions, Trigonometry, Differentiation and integration, Numerical methods.
Module 5: C4 – Algebra and graphs, Differentiation and integration, Differential equations, Vectors.
Module 6: M1 – Force as a vector, Equilibrium of a particle, Kinematics of motion in a straight line, Newton's laws of motion, Linear momentum.
or
D1 – Algorithms, Graph theory, Networks, Linear programming.
or
S1 – if not done in Year 12.

This schedule can be changed if a particular Year 12 group would rather do Mechanics or Decision Mathematics.

Aptitudes, skills or qualities you will need:-

A successful student of A-Level Mathematics should have completed the GCSE higher level course, preferably at grade B or more. They must have studied the A/A* material of GCSE. They should relish the challenge provided by a difficult problem and feel a real sense of achievement when such a problem is solved appreciating the value of the experience, even when unsuccessful. They should be able to find a balance between the persistence necessary to give them a reasonable chance of solving a problem and the awareness that the inability to complete every question presented to them is not a sign of failure. Finally, they should be able to develop an appreciation of the power and beauty of the subject and bring a fluent and skilful elegance to their own work as they mature into a mathematician.

Value of the subject for higher education and future careers:-

The study of AS or A-Level Mathematics provides a sound background for many higher education courses and prospective careers. Many areas of work or study involve the use of algebraic skills, statistical analysis or mathematical models - Geography, Environmental Planning or Engineering for example. A concise and logical approach to problem solving and the ability to deal with abstract concepts engendered by the study of the subject is an asset, even in fields where there is not direct application of the subject content – e.g. operational research, strategic development.