FURTHER MATHEMATICS

ADVANCED LEVEL COURSES AS/A2

ST MARY'S COLLEGE

INTRODUCTION

Any especially able student (ie one who gets an A or A* at Mathematics GCSE) who really enjoys Mathematics and who is thinking of doing Mathematics at A level and beyond, should seriously consider this course. It is done in addition to the AS and A level Mathematics course.

Content

The AS Further Mathematics course is available to both Year 1 and Year 2 students. This consists of 3 modules:

Decision Mathematics 1 (MD01) AS Module	Basic network theory, minimum connectors, shortest routes, route inspection, travelling salesperson, matching linear programming, sorting, algorithms.
Further Mathematics 1 (MFP1) AS Module	Roots of quadratic equations, complex numbers, algebra, graphs, numerical methods, trigonometry, matrices and transformations.
Mechanics 3 (MM03) A2 Module	Relative motion, dimensional analysis, collisions in one or two dimensions, further projectiles, including on inclined planes.

The A2 Further Mathematics course is available to Year 2 students who have successfully completed the AS Level Mathematics and Further Mathematics courses. This also consists of 3 modules:

Further Pure Mathematics 3 (MFP3) A2 Module	Series and limits, polar coordinates, first and second order differential equations.
Further Pure Mathematics 4 (MFP4) A2 Module	Vectors and 3-dimensional geometry, matrix algebra, solution of linear equations, determinant.
Statistics 2 (MS2B)	Discrete random variables including the Poisson Distribution, continuous random variables, estimation, hypothesis testing, the chi-squared test.

Or

Mechanics 2 (MM2B)	Further kinematics, centre of mass, moments, circular motion and differential equations.

How is the course delivered?

4 hours 35 minutes contact time per week. There will be teacher input and time for discussion with the teacher or in small groups. Students will be encouraged to become independent learners.

There will be some note taking, but the emphasis will be on consolidation of new ideas by doing plenty of practice questions. We will do practical activities at appropriate times and will make good use of computer software. Students will have to access Mymaths and MEI resources through the Further Maths Network. Students will be encouraged to make use of graphical calculators.

Entry requirements

Five GCSE passes at higher grades, including an A or A* in Mathematics.

What skills and interests do I need?

There is a high algebra content, so you need to be comfortable working with algebraic expressions. You need to be able to solve equations and inequalities. We expect you to do a lot of work outside class, so you need to be well organised. There will be regular homework set. You will a scientific calculator although we recommend that you use a graphical calculator.

How does it build upon studies in Key Stage 4?

The work will soon become more challenging and demanding. There will be plenty of difficult algebraic manipulation in the Further Pure 1 work. The Decision Maths 1 work will be very different from anything that you have done at GCSE level.

How is the course assessed?

The course is assessed by the AQA Examination Board

Each module is assessed through a written paper lasting 1 hour 30 minutes taken in the January or June.

January 1st Year	Decision Mathematics 1
June 1st Year	Further Pure Mathematics 1 and Mechanics 3
January 2nd Year	Further Pure Mathematics 3
June 1st Year	Further Pure Mathematics 4 and Statistics 2 or Mechanics 2

Progression routes

Mathematical ability is very highly regarded both by universities and employers. Having an A level in Mathematics is essential for many courses (eg Physics, Engineering, etc) and is desirable for other subjects such as Chemistry, the Natural Sciences, Computing, Architecture, Economics, Business and Finance etc. If you want to do a degree in Mathematics or a mathematics related subject, including Engineering and Physics at top universities, Further Maths will either be required or desired. There is a national shortage of mathematicians, so career prospects are good.

Further Information

For further information please contact Huda Dawood, Keith Turland and Robert Williams

Full specifications can be found by visiting
www.aqa.org.uk/qual/gceasa/mathematics.html

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