

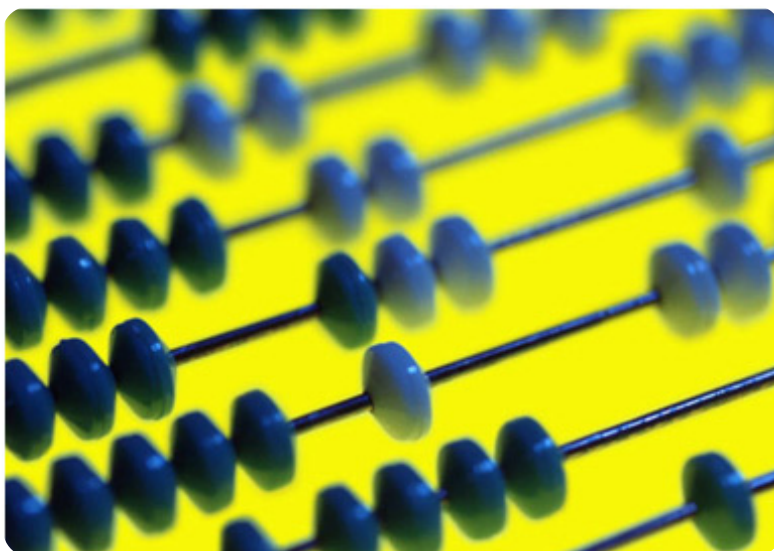
Mathematics with Mechanics

A Level

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Exam Board: AQA



What is the course about?

The course consists of 6 modules - 4 Pure Maths, 1 Discrete Maths and 1 Mechanics.

Pure Maths is the study of mathematical ideas and methods for their own sake and to give a "toolkit" for solving mathematical problems. All Pure Maths is expressed in terms of algebra. Discrete Maths involves solving problems involving networks, using procedures called "algorithms". Many of the problems involve finding the most efficient way to do something, for example finding an efficient route for a salesperson to visit a series of towns. Mechanics involves using Maths to describe the motion of objects and how they respond to forces acting on them - from cars in the street to satellites revolving round a planet. It includes topics such as energy and collisions.

For the AS level you will study:

During the AS year, you will study two modules of Pure Maths (C1 & C2) followed by one module of Discrete Maths (D1)

For the A2 level you will study:

In the A2 year, you will study two more modules of Pure Maths (C3 & C4) and a module of Mechanics (M1)

How is the course assessed?

Six 1 hour 30 minute module exams - 3 in the first year, 3 in the second year. There is no coursework.

What skills will I develop in this course?

You learn to solve problems by reasoning clearly in a step-by-step, logical way using algebra. The main activity is working on problems – with discussion in lessons and on your own outside lessons.

What can the course lead to in terms of higher education and future careers?

A level Maths is required for most university courses in Maths, Physics, Chemistry (straight Chemistry degrees), Engineering, Economics (the more mathematical courses), Management Science (some courses), Computer Science (but not IT more broadly) and some Architecture courses.

A level Maths provides a helpful background for the mathematical parts of university courses in Biological and Environmental Sciences, Business Studies (at least on some of the more mathematical courses) and Psychology (because of its Statistics content). Students who have not taken Maths beyond GCSE often struggle with the mathematical parts of these courses.

What are the formal entry requirements for this course?

A level Mathematics is a strongly theoretical course that is assessed by exams and builds directly on GCSE work in Mathematics. National evidence suggests it is difficult to succeed unless you have an appropriate base of knowledge and a good track-record of success in exam based courses at GCSE. To ensure a reasonable chance of success our recommendation is at least **B grade in GCSE Maths**.

Which aspects of GCSE Mathematics are important for the A level Course?

Fluency in algebra is vital for success on this course. It is easy to underestimate this. Can you

- Solve equations – including simultaneous and quadratic equations (factorising and the formula)?
- Rearrange formulas?
- Work with fractions and negative numbers without a calculator (absolutely essential)?
- Solve problems - for example using trigonometry?
- Draw graphs of functions from their equations without calculating values point by point?

What extra support / enrichment activities are on offer?

The department runs daily maths clinics during lunchtimes. The purpose of these is to provide a place for students to discuss problems with homework and get some individual help.

What is the difference between Maths with Statistics and Maths with Mechanics?

Mechanics links particularly well with A level Physics and is relevant to university courses in Maths, Physics, Engineering and Architecture. If you are likely to do A level Physics then Maths with Mechanics is probably the right course for you. Maths and Statistics is slightly more general and is the course that the majority of our students take.



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