Kimberley School

A Level FURTHER MATHS

SIXTHFORM MATHS

East Midlands Education Trust

SUBJECT BOOKLET

What is Further Mathematics?

Over 5,000 years ago Mathematics evolved from basic numeracy into a new language to precisely describe the universe around us and as a tool for mankind to make its mark on the planet. From the Great Pyramids of Giza to the Apollo Space Program, Mathematics has been at the heart of humanities most impressive achievements. In our modern society it plays an essential role in Economics, Engineering, Science & Technology. In the past 500 years, Mathematics has extended past the confines of physical reality and now represents an exciting frontier for the realms of human thought.

A-level Further Mathematics is designed to broaden and deepen the mathematical knowledge and skills developed when studying A-level Mathematics. It provides a stimulating experience for those who enjoy the subject as it delves into the complexities of reasoning and logic.

Topics such as matrices and complex numbers are introduced for the first time, while others, such as algebra, calculus and trigonometry are studied in greater depth.

At the Kimberley 6th Form two additional modules are taken; discrete mathematics, (the theory behind computation), and advanced mechanics (the application of advanced mathematical modelling).

Students planning for a degree in areas such as mathematics, physics, engineering or economics will benefit greatly from taking A-level Further Mathematics.

Who is it for?

To take A-level Further Mathematics you must achieve at least a grade 7 in GCSE mathematics and take A-level Mathematics. Students will be expected to dedicate their time to gaining complete fluency in mathematical manipulation as well as logical reasoning. As outlined above, further mathematics is for those who wish to take mathematics, or a course based in mathematics. It also helps for applications to Oxbridge Universities for these courses.

What will I study?

As of 2017 the specification of content and methods of assessment have changed for all exam boards across England. Consequently, the content covered by each exam board is very similar but the combinations of optional topics can vary. The Kimberley Mathematics Department enters students for the AQA A-Level Further Mathematics (7367) course, having taught the Mechanics and Discrete optional content, please see AQA.org.uk for more information and updates.

First Year

First year specifications in Further Mathematics must require students to demonstrate the overarching knowledge and skills contained in sections **OT1**, **OT2** and **OT3**. These must be applied, along with associated mathematical thinking and understanding, across the whole of the detailed content in sections **B** to **DG.**

- OT1: Mathematical argument, language and proof
- OT2: Mathematical problem solving
- OT3: Mathematical modelling
- A: Proof
- B: Complex Numbers
- C: Matrices
- D: Further algebra and functions
- E: Further Calculus
- F: Further Vectors
- G: Polar coordinates
- H: Hyperbolic functions
- L: Coordinate geometry
- MA: Dimensional analysis
- MB: Momentum and collisions
- MC: Work, energy and power
- MD: Circular Motion
- DA: Graphs
- DB: Networks
- DC: Network flows
- DD: Linear programming
- DE: Critical path analysis
- DF: Game theory for zero-sum games
- DG: Binary operations

For more details about first year Further Mathematics content please speak to a member of our KS5 team or visit AQA.org.uk.

A2

A-level specifications in Mathematics require that students meet the first year specifications and content detailed above and to a more advanced level**.** Additional content for the A-level is the following sections;

- I: Differential equations
- J: Trigonometry
- K: Numerical methods
- ME: Centres of mass and moments
- DG: Binary operations and group theory

For more details about A- Level Further Mathematics content please speak to a member of our KS5 team or visit AQA.org.uk.

How will I be assessed?

Changes in A-level assessment have meant that all courses are now linear meaning that students will sit all examinations at the end of the course. To prepare students for this we have a rigorous scheme of assessment which allows us to provide effective and individual support for every student. Assessment takes the following forms;

- Assessed homework at the end of each content section
- In-class testing on all covered content at the end of each half term
- A mock exam during 6th Form Mock Exam Week (see school calendar)
- End of year examinations (see details below)

For the end of first year examination, students will be expected to pass Paper 1 & Paper 2 detailed as follows;

Paper 1	Paper 2
Content: Sections B, C, D, E, F, G, H, L.	Content: Sections MA, MB, MC, MD, DA, DB, DC, DD, DE, DF, DG.
Duration: 1 hour 30 minutes	Duration: 1 hour 30 minutes
Weighting: 50% of first year grade	Weighting: 50% of first year grade
Questions: A mix of questions from short, single-mark questions to multi-step problems.	Questions: A mix of questions from short, single-mark questions to multi-step problems.

For the A-level Further Mathematics qualification in June 2024 students will sit Paper 1, Paper 2 & Paper 3 detailed as follows;

Paper 1	Paper 2	Paper 3
Content: Sections A, B, C, D, E, F, G, H, I, J, K, L.	Content: Sections A, B, C, D, E, F, G, H, I, J, K, L.	Content: MA, MB, MC, MD, ME, DA, DB, DC, DD, DE, DF, DG.
Duration: 2 hours	Duration: 2 hours	Duration: 2 hours
Weighting: 33⅓ % of A-Level	Weighting: 33⅓ % of A-Level	Weighting: 33⅓ % of A-Level
Questions: A mix of questions from short, single-mark questions to multi-step problems.	Questions: A mix of questions from short, single-mark questions to multi-step problems.	Questions: A mix of questions from short, single-mark questions to multi-step problems.

For more information please see Mr R. Jolly