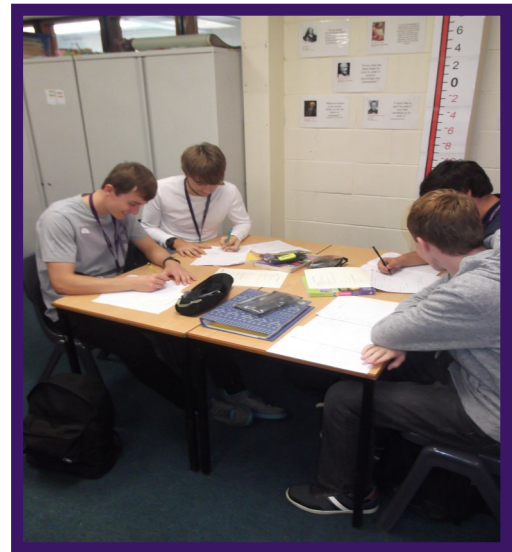post 16

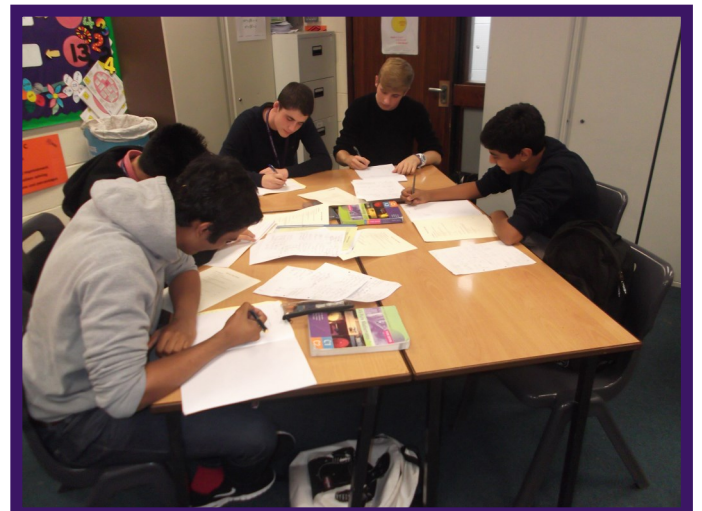**Groby Community College**
*Achieving Excellence Together*

# MATHEMATICS

MATHS

FURTHER MATHS

QUANTITATIVE METHODS

# MATHEMATICS, FURTHER MATHEMATICS & QUANTITATIVE METHODS ENTRY REQUIREMENTS

## MATHEMATICS

The entry requirements Required to have an A*, A or B on the Higher Tier Mathematics GCSE.

## FURTHER MATHEMATICS

The entry requirements: A* or A in the Higher tier Mathematics GCSE and also be studying Mathematics A level.

## QUANTITATIVE METHODS

The entry requirement: C Grade in Mathematics GCSE

# MATHEMATICS AS/A2 LEVEL AND FURTHER MATHEMATICS AS/A2 LEVEL

We offer the MEI Structured Mathematics Scheme. This is a modular course, examined by OCR. There are 6 modules or 'components', which are taken over 2 years to complete the full A level award.  It is also possible to study for an AS level award by covering 3 modules over the first year.

Mathematics at A level builds on and develops the ideas studied for GCSE but also introduces many new concepts. The course develops problem solving skills and analytical capabilities. Mathematics can be studied with a wide variety of other  subjects.

**A good knowledge of algebra and geometry are absolutely crucial for students beginning AS Mathematics.**

A high level of online support is offered from MEI. This includes examples, notes, video clips, presentations and assessments.

**The Course Content**

| Course Content | Topics |
| --- | --- |
| Core 1<br>Introduction to Advanced Mathematics | Proof, co-ordinate geometry, algebra, polynomials and curve sketching. |
| **Statistics 1** | Statistical process, data presentation, probability, discrete random variables, the binomial  distribution,  hypothesis testing. |
| Core 2<br>Concepts for Advanced Mathematics | Algebra, sequences and series, trigonometry, calculus and curve sketching. |

**Mathematics AS (3 Modules)**
**Mathematics A2(3 modules)**

| Course Content | Topics |
| --- | --- |
| Core 3<br>Methods for Advanced Mathematics | Proof, exponentials and logarithms, functions, calculus and numerical methods. This module has a  coursework component. |
| **Core 4**<br>Applications of Advanced Mathematics | Algebra, trigonometry, parametric equations, calculus and vectors. |
| Mechanics 1 | modelling, vectors, kinematics, force, Newton's laws of motion, projectiles. |

**Further Mathematics AS** (3 modules)

This is an optional addition available to those studying the Mathematics A Level.  It is recommended only to the most able students and those wishing to study a Mathematics related degree course in the future.

For suitable students, the option to continue AS Further Mathematics into Year 13 to complete A2 Further Mathematics will be available.

**Assessment**

The

| Course Content | Topics |
|---|---|
| **Further Pure 1** | complex numbers, curve sketching, proof, algebra and matrices. |
| **Decision 1** | algorithms, graphs, networks, linear programming, critical path analysis and simulation. |
| **Statistics 2** | Regression, Normal Distribution, Poisson Distribution and Correlation. |

method of assessment is based on credit accumulation across the modules studied.  Examinations last 1 hour 30 minutes each.

In addition, there is a short piece of coursework in Core 3 (end of year 12) and a mathematical comprehension paper in Core 4 (end of year 13).

Every component passed can be counted towards the A level or AS level. Three components will give you AS certification, 6 will give A level certification and as described earlier it is possible to extend into Further Mathematics.

**Calculators**

Although no calculators are allowed at all in module C1, it is expected that in all other modules students will have access to Scientific or Graphical Calculators.  These are available to buy from the College.

**Method of Working**

The style of teaching and the way in which you learn will be familiar to you from the GCSE course.  We expect you to take more responsibility for your understanding and learning.  After every lesson you will spend time organizing your notes, trying questions and making sure you do understand.  It is up to you to seek help from your teachers between lessons if you do not.  There will be regular assessments and you are required to pass them all.

During the course you may learn to use a graphical calculator.  It draws graphs, is programmable and has many facilities, which you will come to rely on.  If you have one, you will be able to use it in all module exams except the first module C1.  This is a non-calculator paper.

As well as being a subject in its own right, Mathematics is used in many other areas.  The Mathematics AS and A2 courses will support your studies in other advanced courses.  Some University courses require an advanced Mathematics qualification.  If you are contemplating studying Mathematics or a related subject at University, you should seriously consider taking the Further Mathematics AS or A level.  We can also support those students who need to sit STEP and AEA/MAT papers for entry into some top-flight universities.

**Combining with other subjects**

Most other subjects can be combined with A level Mathematics. It is particularly useful with Physics and Chemistry but can also support the mathematical aspects of Biology or Social Sciences. Increasingly, information in all areas is being analysed in a mathematical way.

After A2 Level

Some Higher Education institutions require or prefer Mathematics A level for acceptance onto certain degree courses; these include: -

| | | | |
|---|---|---|---|
| Agriculture | Engineering | Geology | Accountancy/Finance |
| Biophysics | Technology | Physics | Architecture |
| Chemistry | Business Studies | Mathematics | Statistics |
| Computer Science | Economics/Econometrics | | |

Many employers will regard highly an A level in Mathematics. For some careers it may be vitally important: -

| | | | |
|---|---|---|---|
| Astronomer | Architect | Accountant | Physicist |
| Actuary | Engineer | RAF Engineering Officer | |

For more information, help or advice about Mathematics AS/A2, contact:
**Ian Maynard / Pete Temperton on 0116 287 9921 ext 252/238**

# AS LEVEL IN QUANTITATIVE METHODS

This course is run by the Mathematics Department and is aimed at those students that need to have some mathematical knowledge to support their other subjects, but who don't want to sign up to a complete AS or A level in Mathematics.

Quantitative Methods is a level 3 course that consists of three units which combine to produce a full AS level in Quantitative methods.

| Course Content | Topics |
| --- | --- |
| Unit 1: Quantitative methods | Dealing with probability; mathematical and financial modelling; using spreadsheets; statistics; finance; exponential growth and decay; and graphs and gradients. |
| | Assessment: 1hr 30min exam and a short piece of coursework to assess the unit. |
| Unit 2: Statistics 1 | Statistical process, data presentation, probability, discrete random variables, the binomial distribution, hypothesis testing. |
| | Assessment: 1hr 30 min exam |
| Unit 3: Discrete mathematics 1 | Algorithms, graphs, networks, linear programming, critical path analysis and simulation. |
| | Assessment: 1hr 30 min exam |

To find out more, please speak to a member of the

Mathematics Department.

**0116 2879921**