

AS Level Mathematics (Core & Statistics)

Course Title: Mathematics (Core & Statistics) AS Level

Examination Board: Edexcel

What special qualifications do I need?

You need at least a grade A at GCSE Mathematics plus 6 other GCSEs at Grade B+. A love of and proficiency with algebra is essential!

What will I study and learn?

Core Maths 1 & 2

- (2 modules, comprising two-thirds of the course.)
- Topics include:
- Algebraic manipulation
- Various equations and inequalities
- Coordinate geometry of lines and curves
- Arithmetic and geometric sequences
- Basic differentiation and integration
- Factor and remainder theorems
- Binomial expansion
- Trigonometric graphs and identities
- Logs

Statistics 1

- Graphical representation of data
- Measures of centrality and dispersion
- Probability
- Correlation and regression
- Random variables
- Statistical models
- The discrete uniform distribution
- The normal distribution

How will I be assessed?

There are three exams in June of Year 12. These are *Core 1*, *Core 2* and *Statistics 1*. Each exam is 1_ hours long.

How will it help me?

Studying mathematics at this level helps develop skills including exploring the rigour of logical arguments and the challenge of problem solving.

AS Level maths is a very challenging but highly valued qualification. The *Core Maths + Statistics* AS-Level is useful in an increasingly diverse range of degrees or careers, for example: accountancy, computing, cybernetics, economics, environmental studies, information technology, medicine, psychology, statistics, sports science, teaching..... and of course further study of mathematics.

Who do I see for more information?

Mr Curnow or Mr McAteer (Head of Mathematics)

Course Title: A-Level Mathematics (Core & Statistics) - 2 years, including the AS year.

Examination Board: Edexcel

What special qualifications do I need?

A satisfactory pass at AS Mathematics

What will I study and learn?

Core Maths 3 & 4

(Again 2 modules; two-thirds of the course.)

Topics include:

- Algebraic fractions
- Functions
- Advanced trigonometry
- Exponential and logarithmic functions
- Further differentiation and integration
- Numerical methods
- Extending the binomial expansion
- Parametric coordinate geometry
- Differential equations
- Vectors

Statistics 2

- Orderings, permutations and combinations
- The binomial distribution
- The Poisson distribution
- General continuous random variables
- The continuous uniform distribution
- Sampling and hypothesis testing

How will I be assessed?

Again there are three exams, each 1_ hours long.

Core 3 is usually taken in January of Year 13.

Core 4 and *Statistics 2* are sat in June of Year 13.

Again, there is no coursework.

How will it help me?

Studying mathematics at this level helps develop skills including exploring the rigour of logical arguments and the challenge of problem solving.

A Level maths is a very challenging but highly valued qualification. The *Core Maths + Statistics* A-Level is useful in an increasingly diverse range of degrees or careers, for example: accountancy, computing, cybernetics, economics, environmental studies, information technology, medicine, psychology, statistics, sports science, teaching..... and of course further study of mathematics.

Who do I see for more information?

Mr Curnow or Mr McAteer (Head of Mathematics)

AS Level Mathematics (Core & Mechanics)

Course Title: Mathematics (Core & Mechanics) AS Level (1 year)

Examination Board: Edexcel

What special qualifications do I need?

You need at least a grade A at GCSE Mathematics plus 6 other GCSEs at Grade B+. A love of and proficiency with algebra is essential!

What will I study and learn?

Core Maths 1 & 2

- (2 modules, comprising two-thirds of the course.)
- Topics include:
- Algebraic manipulation
- Various equations and inequalities
- Coordinate geometry of lines and curves
- Arithmetic and geometric sequences
- Basic differentiation and integration
- Factor and remainder theorems
- Binomial expansion
- Trigonometric graphs and identities
- Logs

Mechanics 1

- Modelling
- Vectors
- Kinematics (Motion of particles)
- Statics (Forces on stationary particles)
- Kinematics (Forces on moving particles)
- Moments of forces.

How will I be assessed?

There are three exams in June of Year 12.
These are *Core 1*, *Core 2* and *Statistics 1*.
Each exam is 1_ hours long.

How will it help me?

Studying mathematics at this level helps develop skills including exploring the rigour of logical arguments and the challenge of problem solving.

AS Level maths is a very challenging but highly valued qualification. The *Core Maths + Mechanics* AS-Level is useful in an increasingly diverse range of degrees or careers, for example: accountancy, architecture, computing, cybernetics, economics, engineering, environmental studies, information technology, medicine, physics, sports science, teaching..... and of course further study of mathematics.

Who do I see for more information?

Mr McAteer (Head of Mathematics), Mrs Faraday or Ms Thompson

A-Level Mathematics (Core & Mechanics)

Course Title: A-Level Mathematics (Core & Mechanics) - 2 years, including the AS year.

Examination Board: Edexcel

What special qualifications do I need?

A satisfactory pass at AS Mathematics

What will I study and learn?

Core Maths 3 & 4

(Again 2 modules; two-thirds of the course.)

Topics include:

- Algebraic fractions
- Functions
- Advanced trigonometry
- Exponential and logarithmic functions
- Further differentiation and integration
- Numerical methods
- Extending the binomial expansion
- Parametric coordinate geometry
- Differential equations
- Vectors

Mechanics 2

- Kinematics including Projectiles
- Centres of mass of frameworks and Lamina's
- Work, Energy and Power
- Collisions including Newtons Law of Restitution
- Statics of rigid bodies.
- Moments of Forces.

How will I be assessed?

Again there are three exams, each 1_ hours long.
Core 3 is usually taken in January of Year 13.
Core 4 and *Statistics 2* are sat in June of Year 13.
Again, there is no coursework.

How will it help me?

Studying mathematics at this level helps develop skills including exploring the rigour of logical arguments and the challenge of problem solving.

A Level maths is a very challenging but highly valued qualification. The *Core Maths + Mechanics* A-Level is useful in an increasingly diverse range of degrees or careers, for example: accountancy, architecture, computing, cybernetics, economics, engineering, environmental studies, information technology, medicine, physics, sports science, teaching..... and of course further study of mathematics.

Who do I see for more information?

Mr McAteer (Head of Mathematics), Mrs Faraday or Ms Thompson

AS Level Further Mathematics

Course Title: AS Further Mathematics (1 year)

Examination Board: Edexcel

What special qualifications do I need?

You will already have applied to study mathematics at AS or A-Level.

You need a strong grade A* at GCSE and a recommendation from your Year 11 teacher.

A love of mathematics - especially algebra - is absolutely essential! You also need to be willing and able to give over significant amounts of your free time. The main face-to-face study sessions take place for several hours each Thursday after school and are taught by a specialist teacher from the national Further Maths Network. There may also be some modules taught online.

What will I study and learn?

The course could really be called 'Wider Mathematics', as what is offered will result in a broadening of your mathematical skills and experience.

You will study the module *Further Pure 1* and 2 other modules.

Further Pure 1

- Complex numbers
- Numerical methods
- Parabolas and hyperbolas
- Matrices
- Series
- Proof

The other 2 modules could be *Mechanics*, *Statistics* or *Decision Maths* modules, depending on your aptitude, interest and which modules you are studying in your Maths AS or A-Level. The plan is to tailor the modules to compliment your AS or A2 maths choices and suit your own career plans.

How will I be assessed?

By three 1_ exams (in June or maybe January).

How will it help me?

In addition to the benefits listed for the Core and Mechanics / Core and Statistics, studying Further Mathematics will broaden your mathematical experience and prepare you for the most demanding university entry requirements. Students who achieve success in Further Mathematics are recognised to have a powerful skill set and are likely to be in high demand with universities and employers.

Students of this calibre may also want to study STEP or AEA qualification to support applications to the most prestigious universities.

Who do I see for more information?

Mrs Calder (Manager – Gloucestershire Further Maths Centre) or Mr McAteer (Head of Mathematics)

A-Level Further Mathematics

Course Title: Further Mathematics A-Level (2 years)

Examination Board: Edexcel

What special qualifications do I need?

You will already be studying mathematics A-Level and have successfully completed AS Further Maths. A love of mathematics - especially algebra - is absolutely essential! You also need to be willing and able to give over significant amounts of your free time. The main face-to-face study sessions take place for several hours each Thursday after school and are taught by a specialist teacher from the national Further Maths Network. There may also be some modules taught online.

What will I study and learn?

The course could really be called 'Wider Mathematics', as what is offered will result in a broadening of your mathematical skills and experience.

What further topics will I study and learn?

You will study 3 more modules in addition to the 3 studied in your AS Further Maths. You will study either *Further Pure 2* or *Further Pure 3* plus 2 other modules. Again, there is a lot of flexibility about these 2 modules; you will be able to choose from modules in *Mechanics*, *Statistics*, and *Decision Maths* or study an extra *Further Pure* module.

For lots of information about Further Maths, please visit www.fmnetwork.org.uk

How will I be assessed?

By three 1_ exams (in June or maybe January).

How will it help me?

In addition to the benefits listed for the Core and Mechanics / Core and Statistics, studying Further Mathematics will broaden your mathematical experience and prepare you for the most demanding university entry requirements. Students who achieve success in Further Mathematics are recognised to have a powerful skill set and are likely to be in high demand with universities and employers.

Students of this calibre may also want to study STEP or AEA qualification to support applications to the most prestigious universities.

Who do I see for more information?

Mrs Calder (Manager – Gloucestershire Further Maths Centre) or Mr McAteer (Head of Mathematics)

AS Level Use of Maths

Course Title: AS Use of Maths (1 year)

Examination Board: AQA

What qualifications do I need?

You need at least a grade C (preferably grade B) at GCSE Mathematics plus at least 3 other GCSEs at Grade C or above. Students should be extremely confident in their algebraic and graphical skills before considering this course.

What will I study and learn?

The course is an exciting opportunity to study more Mathematics for **one** year to support other subjects, as well as preparing students for further studies. There is a significant emphasis on the modelling of real life problems from diverse areas such as Business Studies, Economics, Science and Technology.

There are 3 units of assessments, equally weighted:-

1. Working with Algebraic and Graphical Techniques:

- Models of direct proportion
- Linear models, inequalities and simultaneous equations
- Quadratic models
- Rates of growth and decay
- Growth and decay rates using exponential and logarithmic functions
- Transforming graphs of functions and relating them to real world situations
- Checking the validity of a mathematical model

2. Using and Applying Statistics:

- Collecting data, sampling techniques
- Averages, inter-quartile range, standard deviation
- Drawing and interpreting Charts and graphs
- Scatter diagrams, correlation and regression models
- Normal distribution and probability
- Critical analysis
- Extension opportunities include: Non-linear regression, Spearman's rank, binomial and Poisson Distributions, significance testing

3. Applying Mathematics:

- Modelling and simulating random events
- Using recurrence relationships
- Applying all the skills learnt in the Working with Algebraic and Graphical Techniques to model new problems in a range of different contexts.

How will I be assessed?

Working with Algebra and Graphs and *Using and Applying Statistics* are both assessed 50% by 1_ hour examination and 50% by coursework portfolio; *Applying Mathematics* is assessed by 2 exams, the first 1 hour and the second 1_ hours. In total there are 4 examinations.

How will studying this subject help me?

The Use of Maths course delivers a lot of essential maths skills in real life situations. It will equip students with the skills needed to model mathematically in a wide range of contexts. This is a one year course, but there is the opportunity for students to then transfer to the traditional AS Maths course earlier in Year 13. This may allow more flexibility in other A2 choices.

Who do I see for further information?

Mr McAteer (Head of Mathematics) or Miss Comens

Course Title: Adult Numeracy, Levels 1 & 2 (1 year)

Examination Board: Edexcel

What qualifications do I need?

There is no qualification required to enrol on this course, just a willingness to learn!

What will I study and learn?

Topics include:

- Understand and use Mathematical Information
- Whole numbers, Fractions, Decimals and Percentages
- Use and understand measure.
- Understand and interpret lists, tables, charts and diagrams.
- Estimate answers to practical problems.
- Use discrete and continuous data and calculate and interpret statistical measures
- Evaluate Expressions
- Use and understand Probability
- Perimeter area and volume

How will I be assessed?

There is a multiple-choice test, consisting of 40 questions, at each level.

The tests are taken on-line when you and your teacher consider that you are ready.

Success at Level 2 could lead to entry on to the GCSE course, within the same academic year.

There is no coursework for this qualification.

How will studying this subject help me?

Adult Numeracy at Level 2 is considered a “GCSE Grade C equivalent” by a number of institutions, in particular for entry to vocational courses.

You will need to check entry requirements of any FE course that you are interested in carefully.

It may be that Adult Numeracy at Level 2 is sufficient, or you may need to go on to (re)take the GCSE with the aim of achieving a grade C.

Who do I see for further information?

Mrs Faraday or Mr McAteer (Head of Mathematics)

GCSE Mathematics

Course Title: GCSE Mathematics (1 year)

Examination Board: Edexcel

What qualifications do I need?

In order to enrol on this course you need a grade D at GCSE Mathematics or an Adult Numeracy pass at Level 2.

If you have not yet achieved a grade D then you should start with the Adult Numeracy course (see previous page for details).

What will I study and learn?

This course consists of the main topics for GCSE Mathematics (Foundation Level).

The main areas of study are:

Number:

Arithmetic, percentages, decimals, fractions, negative numbers, money...

Shape and Measures

Angles, triangles, quadrilaterals, solids, length, area, volume, transformations...

Handling Data

Diagrams, summarising data, probability...

Algebra

Using letters, substitution, simplifying algebra, equations, graphs...

How will I be assessed?

There are two exams, each 1½ hours long.

The 2nd exam requires the use of a calculator.

These exams are usually taken in June.

It may be possible for suitable candidates to sit the exam in November, although they will need to continue with the course until results are known.

There is no longer any coursework required for Maths GCSE.

How will studying this subject help me?

A GCSE Mathematics grade C or higher is an essential qualification for many jobs and FE courses, and is a requirement for most degree courses.

You will need to check entry requirements of any FE course that you are interested in carefully. It may be that Adult Numeracy at Level 2 is sufficient (see previous page for details of this course), or you may need to (re)take the GCSE with the aim of achieving a grade C.

Who do I see for further information?

Mr Curnow or Mr McAteer (Head of Mathematics).