

Mathematics Years 12 & 13 Curriculum

The order of the maths course may vary depending upon the teachers allocated to each group. Parallel groups will cover the same content and all the Year 12 pure content will be covered by the end of year 12.

YEAR 12	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content: What will students know	Algebraic expressions Quadratics Equations and Inequalities Graphs and Transformations	Straight Line Graphs Circles Algebraic Methods Binomial Expansion Trigonometric Ratios	Further Trigonometry Exponentials and Logs Data Presentation and Interpretation	Differentiation Probability Quantities and Units in Mechanics	Integration Statistical Distributions Kinematics	Vectors Hypothesis Testing Forces and Newton's Laws
Skills: What will students be able to do	Appreciate the very big step up in demand from GCSE maths	Begin to apply the foundations of A-level maths to more complicated situations.	Solve multi-level trigonometric equations and manipulate expressions using logarithms	Determine the gradient function for polynomials	Calculate areas below a variety of different curves types	Complete detailed statistical analysis on sets of data.
Other: Literacy / Numeracy / Ethos	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy
Assessment	Baseline Test Chapters 1 – 4 Test	Half-Term Assessment 1; in class exam conditions	Half-Term Assessment 2; in class exam conditions	Half-Term Assessment 3; in class exam conditions	Half-Term Assessment 4; in class exam conditions	End of Year exam (Mock); on which UCAS grades will be initially based.

YEAR 13	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content: What will students know	Further Algebraic methods. Functions, Sequences and Series; Further Binomial	Radians; Further Trigonometry; Parametric Equations; Differentiation	Integration; Numerical methods; Vectors; Regression & Correlation	Conditional Probability; Normal distribution; Moments; Friction	Projectiles; Variable acceleration; Applications of mechanics	Revision & Past papers
Skills: What will students be able to do	Manipulate a variety of complex algebraic expressions	Complete all trigonometry problems using radian measure and find the gradients of many more functions	Solve geometric problems in 3d using vectors	Apply calculations in real-life context for interactions between objects.	Answer A-level maths questions to a high standard	Exam technique; exam paper content
Other: Literacy / Numeracy / Ethos	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy
Assessment	Half-Term Assessment 5; in class exam conditions	Half-Term Assessment 6; in class exam conditions	Mock examination.	Half-Term Assessment 7; in class exam conditions	Practice Paper(s)	External Examinations

Further Mathematics Years 12 & 13 Curriculum

The order and content of the maths course may vary depending upon the teachers allocated to each group and the students within the group.

YEAR 12	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content: What will students know	Complex Numbers; Proof by Induction; Roots of polynomials; Matrices	Series; Argand diagrams; Vectors; Linear Transformations	Volumes of Revolution; Option 1	Option 1	Option 1	Option 2
OPTION 1		<u>Decision</u>	Algorithms; Graphs and Networks; Linear Programming	Algorithms on Graphs; Route Inspection; Simplex Algorithm	Travelling Salesperson; Critical Path Analysis	
OPTION 2					<u>Further Pure 1</u>	Conic Sections; Vector Cross-Product; Numerical Methods
Skills: What will students be able to do	Work with imaginary numbers	Work with matrices	Apply algorithms on graphs	Solve Optimisation problems	Schedule projects	Solve geometric problems using vectors
Other: Literacy / Numeracy / Ethos	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy
Assessment	Baseline Test Chapters 1 – 4 Test	Half-Term Assessment 1; in class exam conditions	Half-Term Assessment 2; in class exam conditions	Half-Term Assessment 3; in class exam conditions	Half-Term Assessment 4; in class exam conditions	End of Year exam (Mock); on which UCAS grades will be initially based.

YEAR 13	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content: What will students know	Exponential Complex Numbers; Polar Coordinates	Series & Macalurins'; Volumes of Revolution 2; Differential Equations	Methods in Calculus; Hyperbolic Functions	Modelling with Differential Equations	Revision & Past papers	
<u>Further Pure 1</u> (OPTION 2)	Conic Sections 2; Inequalities	Further vectors; t-formulae	Taylor Series; Methods in Calculus	Reducible Differential Equations	Revision & Past papers	
Skills: What will students be able to do	Analyse graphs defined by polar coordinates	Solve Differential Equations	Effectively use hyperbolic functions	Model real life situations with a variety of differential equations	Exam technique; exam paper content	
Other: Literacy / Numeracy / Ethos	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy	
Assessment	Half-Term Assessment 5; in class exam conditions	Half-Term Assessment 6; in class exam conditions	Mock examination.	Half-Term Assessment 7; in class exam conditions	External Examinations	External Examinations

Core Mathematics Year 12 Curriculum

YEAR 12	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content: What will students know	Types of data and sampling. Representing and measuring data. Using Excel	Percentages. AER and APR. Tax and NI Fermi Estimations Critical Analysis	Normal Distribution. Normal Probabilities. Use of calculator	Confidence Intervals. Scatter graphs Correlation and Regression	Practice papers and revision	
Skills: What will students be able to do	Critical analyse the collection and presentation of data	Calculate real life money problems. Critically analyse statements made	Calculate probabilities and critical values from normally distributed data sets	Create intervals for population means. Interpolate and extrapolate from collected data	Complete the external exam	
Other: Literacy / Numeracy / Ethos	Numeracy	Numeracy	Numeracy	Numeracy	Numeracy	
Assessment	Informal topic tests	Informal topic tests	Full Mock exam Paper 1 content only.	Informal topic tests	External Exam	