KS5 Curriculum Overview 2023/24

Department: Mathematics

Description of KS5 Curriculum:
The aims and objectives of this curriculum are to enable students to: ● Understand mathematics and mathematical processes in a way that promotes confidence, fosters enjoyment and provides a strong foundation for progress to further study ● Extend their range of mathematical skills and techniques ● Understand coherence and progression in mathematics and how different areas of mathematics are connected ● Apply mathematics in other fields of study and be aware of the relevance of mathematics to the world of work and to situations in society in general ● Use their mathematical knowledge to make logical and reasoned decisions in solving problems both within pure mathematics and in a variety of contexts, and communicate the mathematical rationale for these decisions clearly ● Reason logically and recognise incorrect reasoning ● Use their mathematical skills and techniques to solve challenging problems that require them to decide on the solutions strategy. ● Recognise when mathematics can be used to analyse and solve a problem in context ● Make deductions and inferences and draw conclusions by using mathematical reasoning ● Interpret solutions and communicate their interpretation effectively in the context of the problem ● Read and comprehend mathematical arguments, including justifications of methods and formulae and communicate their understanding.

KS5	Term 1 Content	Term 2 Content	Term 3 Content
Year 12	● Indices. ● Surds. ● Quadratics & discriminants. ● Inequalities. ● Cubics/quartics/reciprocal graphs. ● Transforming graphs. ● Straight lines. ● Circles. ● Factor theorem & polynomial division. ● Binomial.	Pure: ● Vectors in 2D. ● Differentiation. ● Integration. Stats: ● Data/ sampling. ● Measures of location. ● Measures of speed. ● Representation of data. ● Probability.	Stats: ● Distributions. ● Binomial distributions. ● Hypothesis testing. Pure: ● Exponentials. ● logarithms ● Algebraic fractions. ● Partial fractions. ● Mathematical proof.

	• Triangle geometry. • Trigonometric equations & identities.	Mechanics: • Modelling in mechanics/ vectors. • Force diagrams & calculations. • Connected particles. • Pulleys.	
Year 13	• Intro to radians. • Trigonometry with radians. • Small angle approximations. • Sec/cosec/cot. • All differentiation & Pythagorean identities. • Addition formula. • Double angles. • Writing expressions in the form of R sin and R cos. • Proving trigonometric identities. • Integration & trapezium rule. • Rates of change. • Differentiated equations. • Parameters. • Differentiating parameters. • Proof by contradiction. • Modulus functions. • Composites, inverse & sketching. • Arc length/ area (radians).	• Arithmetic sequences/ series. • Geometric sequences/ series. • Sum to infinity. • Sigma notation. • Recurrence relations. • Binominal. • Using partial fractions. • Roots. • Iteration. • Newton-raphson. • 3D vectors. • Calculus with kinematics. • Moments. • Centres of Mass, Tilting, Planes & frictions. • Horizontal/ vertical projections. • Statistics. • Rigid bodies & inclined planes.	• Exponential models. • Correlation & regression. • Hypothesis testing (correlation). • Conditional probabilities. • Tree diagrams. • Normal distribution. • Standardizing the normal distribution. • Approximating the binomial. • Hypothesis testing (normal)