Year 12 Maths- Key Stage 5
A/AS Level

Autumn Term

Half Term 1

Pure:

Algebra and Functions (rec 27 Hours)

Key learning:

Indices, Surds, Quadratic Functions and graphs (discriminants and completing the square), simultaneous equations, linear and quadratic inequalities, polynomials, transformation of curves.

Statistics:

Statistical Sampling (rec 3 Hours)

Key learning:

Populations and Samples, Sampling and Types of Data.

Data Presentation and Interpretation (rec 4 Hours)

Key learning:

Measures of Central Tendency, Measures of Location and Spread, Variance and Standard Deviation and Coding.

Mechanics:

Quantities and Units in Mechanics (rec 3 Hours)

Key learning:

Modelling Assumptions, Quantities and Units, Working with Vectors.

Kinematics 1 (rec 4 Hours)

Key learning:

Displacement-time and Velocity-time Graphs

RECOMMENDATION 41 HOURS
ACTUAL 24 HOURS

Spring Term

Half Term 1

Pure:

Trigonometry (rec 16 Hours)

Key learning:

Sine and Cosine Rules, Area of Triangles, Solving Triangle Problems, Transforming Trigonometric Graphs, Angles in 4 Quadrants, Exact Trigonometric Ratios, Trigonometric Identities and Trigonometric Equations.

Vectors (2D) (rec 14 Hours)

Key learning:

Representing Vectors, Magnitude and Direction, Position Vectors, Solving Geometric Problems and Modelling with Vectors.

Statistics:

Probability (rec 3 Hours)

Key learning:

Calculating Probabilities, Venn Diagrams, Mutually Exclusive and Independent Events and Tree Diagrams.

Statistical Distributions (rec 5 Hours)

Key learning:

Probability Distributions, Binomial Distributions and Cumulative Probabilities.

Mechanics:

Forces and Newtons Laws (rec 4 Hours)

Key learning:

Force Diagrams, Forces as Vectors, Forces and Acceleration (Newtons laws).

RECOMMENDATION 42 HOURS
ACTUAL 24 HOURS

Summer Term

Half Term 1

Pure:

Exponentials and Logarithms (rec 12 Hours)

Key learning:

Exponential Functions, Exponential Modelling, Laws of Logarithms, Solving Equations using Logarithms, Natural Logarithms and Logarithms with non-linear data.

Statistics:

Statistical Hypothesis Testing (rec 5 Hours)

Key learning:

One Tailed and Two Tailed Tests

Mechanics:

Kinematics 2 (rec 7 Hours)

Key learning:

Functions of Time, Using Differentiation and Integration. Maxima and Minima problems. More Constant Acceleration Formulae.

RECOMMENDATION 24 HOURS
ACTUAL 16 HOURS

Half Term 2

Pure:

Coordinate Geometry in the (x,y) plane (rec 13 Hours)

Key learning:

Equation of a straight line, parallel and perpendicular gradients, equation of a circle

Further Algebra (rec 15 Hours)

Key learning:

Algebraic fractions, polynomials, factor theorem, Mathematical Proof, Binomial Expansion, Solving binomial problems.

Statistics:

Data Presentation and Interpretation (rec 8 Hours)

Key learning:

Outliers, Cumulative Frequency and Boxplots, Histograms and Comparison of Data. Correlation and Linear Regression.

Mechanics:

Kinematics 1 (rec 6 Hours)

Key learning:

Constant Acceleration (SUVAT Formulae), Vertical Motion Under Gravity

RECOMMENDATION 42 HOURS

ACTUAL 32 HOURS

Half Term 2

Pure:

Differentiation (rec 12 Hours)

Key learning:

Gradients, tangents and Normals of Curves, Finding 1st and 2nd Derivatives, Differentiating quadratics and expressions with more than 2 terms, Stationary Points, Increasing and Decreasing Functions

Integration (rec 11 Hours)

Key learning:

Definite and Indefinite Integrals, Finding Functions, Areas under curves, the x-axis and lines.

Statistics:

Statistical Hypothesis Testing (rec 2 Hours)

Key learning:

Hypothesis Testing and Finding Critical Values.

Mechanics:

Forces and Newtons Laws (rec 6 Hours)

Key learning:

Motion in 2 Dimensions, Connected Particles and Pulleys.

RECOMMENDATION 31 HOURS

ACTUAL 24 HOURS

Half Term 2 (A-Level course)

Pure:

Proof (rec 3 Hours)

Key learning:

Proof by Contradiction, Exhaustion, Deduction.

Algebraic and Partial Fractions (rec 5 Hours)

Key learning:

Algebraic Fractions, Partial Fractions, Repeated Factors and Algebraic Division

Statistics:

Regression and Correlation (rec 7 Hours)

Key learning:

Mechanics:

Moments (rec 5 Hours)

Key learning:

Year 13 Maths- Key Stage 5
A/AS Level

Autumn Term

Half Term 1

Pure:

Functions and Modelling (rec 10 Hours)

Key learning:

Modulus Function, Functions and Mappings, Composite Functions, Inverse Functions, Combining Functions, Solving Modulus Problems

Series and Sequences (rec 9 Hours)

Key learning:

Arithmetic Sequences, Arithmetic Series, Geometric Sequences, Geometric Series, Sum to Infinity, Sigma Notation, Recurrence Relations and Modelling with Series

The Binomial Expansion/Theorem (rec 7 Hours)

Key learning:

Expanding $(1+x)^n$, Expanding $(a+bx)^n$, Use of Partial Fractions

Statistics:

Probability (rec 7 Hours)

Key learning:

Mechanics:

Forces at any angle (rec 6 Hours)

Key learning:

RECOMMENDATION HOURS

ACTUAL HOURS

Spring Term

Half Term 1

Pure:

Differentiation (rec 16 Hours)

Key learning:

Differentiating $\sin x$ and $\cos x$, exponentials and logarithms, The Chain Rule, The Product Rule, The Quotient Rule, Differentiating Trigonometric Functions, Parametric Differentiation, Implicit Differentiation, Using Second Derivatives, Rates of Change

Numerical Methods (rec 8 Hours)

Key learning:

Locating Roots, Iteration, Newton-Raphson Method, Applications to Modelling

Statistics:

The Normal Distribution part b (rec 5 Hours)

Key learning:

Mechanics:

Applications of Forces (rec 8 Hours)

Key learning:

RECOMMENDATION HOURS

ACTUAL HOURS

Summer Term

Half Term 1

Pure:

Vectors (3D) (rec 4 Hours)

Key learning:

3D Coordinates, Vectors in 3D, Solving Geometric Problems, Application to Mechanics

Statistics:

Mechanics:

RECOMMENDATION HOURS

ACTUAL HOURS

Half Term 2

Pure:

Trigonometry (rec 24 Hours)

Key learning:

Radian Measure, Arc Length, Areas of Sectors and Segments, Solving Trigonometric Equations, Small Angle Approximations, Secant, Cosecant and Cotangent, Graphs and use of sec x, cosec x, cot x, Trigonometric Identities, Inverse Trigonometric Functions, Addition Formulae, Double Angle Formulae, Simplifying $a\cos x \pm b\sin x$

Parametric Equations (rec 5 Hours)

Key learning:

Parametric Equations, Using Trigonometric Identities, Curve Sketching, Points of Intersection, Modelling with Parametric Equations

Statistics:

The Normal Distribution part a (rec 5 Hours)

Key learning:

Mechanics:

Applications of Kinematics (rec 5 Hours)

Key learning:

RECOMMENDATION HOURS

ACTUAL HOURS

Half Term 2

Pure:

Integration parts 1 & 2 (rec 28 Hours)

Key learning:

Integrating Standard Functions, Integrating $f(ax+b)$ Using Trigonometric Identities, Reverse Chain Rule, Integration by Substitution, Integration by Parts, Partial Fractions, Finding Areas, The Trapezium Rule, Solving and Modelling with Differential Equations

Statistics:

The Normal Distribution part c (rec 6 Hours)

Key learning:

Mechanics:

Further Kinematics (rec 6 Hours)

Key learning:

RECOMMENDATION HOURS

ACTUAL HOURS

Half Term 2

Pure:

Statistics:

Mechanics: