

Curriculum Map – Maths A Level

Learning Phase 1 – Year 12		
Knowledge	Skills	Rationale
ALL students cover: Pure - Algebraic manipulation, quadratic equations and graphs - Linear and quadratic inequalities - Simultaneous equations - Vectors - Straight lines and circles - Algebraic Division and the factor theorem - Differentiation - Integration - Curve sketching - Transformations of graphs - Trigonometry - Exponentials and Logarithms - The Binomial Expansion 1 - Proof Yr 13 topics covered in Yr12 - Algebraic Fractions, partial fractions and combined transformations - The Binomial Expansion 2 - Numerical Methods Mechanics - Kinematics in one dimension - Applications of vectors	There are overarching knowledge and skills which students are required to demonstrate which are applied, along with associated mathematical thinking and understanding, across the whole of the content as set out in the Knowledge column: Mathematical argument, language and proof - Construct and present mathematical arguments through appropriate use of diagrams; sketching graphs; logical deduction; precise statements involving correct use of symbols and connecting language, including: constant, coefficient, expression, equation, function, identity, index, term, variable. - Understand and use mathematical language and syntax as set out in the content. - Understand and use language and symbols associated with set theory, as set out in the appendices. Apply to solutions of inequalities. - Comprehend and critique mathematical arguments, proofs and justifications of methods and formulae, including those relating to applications of mathematics. Mathematical problem solving - Recognise the underlying mathematical structure in a situation and simplify and abstract appropriately to enable problems to be solved. - Construct extended arguments to solve problems presented in an unstructured form, including problems in context. - Interpret and communicate solutions in the context of the original problem.	The order in which topics are taught are broadly as recommended by the Route Map provided by AQA, the exam board which we use. Changes (see below) have been made to account for mechanics teaching in A level maths and Further maths. Each of the 3 areas (Pure, Mechanics and Statistics) are taught by 3 separate teachers. Mechanics and statistics are taught in 5 month blocks, not concurrently. When not formally being taught an applied module, regular consolidation and review work is set to be completed in independent study time, to keep the skills alive. Further maths students are placed in the same Maths A level class and these students follow the mechanics module up to January. This ensures that knowledge needed for the further maths mechanics is taught before required. Vectors taught by both pure and applied teachers. Pure vectors taught by pure teachers. Mechanics teacher applies the pure theory for applications in mechanical problems. Basic Differentiation and Integration needed for variable acceleration problems in mechanics. Vectors and Calculus covered in pure before needed in mechanics. The order of topics are determined generally by the knowledge and skills which are pre-requisites for future topics.

• Forces and Newton's laws Statistics • Statistical sampling • Data presentation and interpretation • Probability and statistical distributions • Statistical hypothesis testing	• Evaluate, including by making reasoned estimates, the accuracy or limitations of solutions. • Understand the concept of a mathematical problem solving cycle, including specifying the problem, collecting information, processing and representing information and interpreting results, which may identify the need to repeat the cycle. • Understand, interpret and extract information from diagrams and construct mathematical diagrams to solve problems, including in mechanics. Mathematical modelling • Translate a situation in context into a mathematical model, making simplifying assumptions. • Use a mathematical model with suitable inputs to engage with and explore situations (for a given model or a model constructed or selected by the student). • Interpret the outputs of a mathematical model in the context of the original situation (for a given model or a model constructed or selected by the student). • Understand that a mathematical model can be refined by considering its outputs and simplifying assumptions; evaluate whether the model is appropriate. • Understand and use modelling assumptions.	The subject content was set out by the Department for Education (DfE) and is common across all exam boards.
Assessment 1 (NOV/DEC): Pure Paper (1 hour) and Applied Paper (1 hour – Mechanics or Statistics). Papers completed in class. Assessment 2 (MAR/APR): Pure Paper (1 hour) and Applied Paper (1 hour – Mechanics or Statistics). Papers completed in class. Assessment 3 (JUNE): One 2hour AS Pure paper and one 1hour Applied Paper (Statistics and Mechanics)		