Year 11 **Higher Curriculum Overview** **Subject: Mathematics**

Year 11 Overview:

In year 11 students build towards the final exam in Summer. Students are retrieving knowledge and skills learnt prior and begin looking at algebra proof. Topics at A-Level are introduced and some students are encouraged to take an additional GCSE in Further Mathematics. Mock exams take place near Christmas

Autumn Term

Outline of Key Learning	Hegarty Code	Lesson
Quadratics and Further Graphs (15) a. Sketch a graph of a quadratic function, by factorising or by using the formula, identifying roots, y-intercept and turning point by completing the square b. Solve simultaneous equations graphically c. Expand the product of more than two linear expressions d. Solve linear inequalities in two variables graphically; e. Use iteration with simple converging sequences	257, 898 218, 219 164, 166 273 - 276 322	Sketching Equations Expanding Inequalities Iteration
Further Trigonometry (13a, 13b) a. Recognise, sketch and interpret graphs of the trigonometric functions (in degrees) y = sin x, y = cos x and y = tan x for angles of any size b. Apply to the graph of y = f(x) the transformations y = –f(x), y = f(–x) for sine, cosine and tan functions f(x) c. Apply to the graph of y = f(x) the transformations y = f(x) + a, y = f(x + a) for sine, cosine and tan functions f(x) d. Know and apply $\text{Area} = \frac{1}{2}ab\ \text{Sin}\ C$ to calculate the area, sides or angles of any triangle e. Know the sine and cosine rules, and use to solve 2D problems (including involving bearings) and 3D problems f. Understand, recall and use trigonometric relationships and Pythagoras' Theorem in right-angled triangles, and use these to solve problems in 3D configurations	303 – 305 854 – 862 516 – 519 531 – 533 854 - 863	Trigonometry Graphs Advanced Trigonometry Advanced Trigonometry 2 Advanced Trigonometry and 3D

Algebraic Fractions (17) a. Rationalise the denominator involving surds b. Simplify algebraic fractions, multiply and divide algebraic fractions c. Solve quadratic equations arising from algebraic fraction equations d. Change the subject of a formula, including cases where the subject occurs on both sides of the formula, or as a denominator e. Find f(x) + g(x) and f(x) – g(x), 2f(x), f(3x) etc algebraically; f. Find the inverse of a linear function g. For two functions f(x) and g(x), find gf(x)	118, 119 172, 187, 244 283 – 286 293 – 296	Rationalise Surds Algebraic Fractions Change the Subject Functions
Christmas Mock		

Spring Term		
Outline of Key Learning	**Hegarty Code**	**Lesson**
Constructions, Loci and Bearings (8b) a. Calculate bearings and solve bearings problems, including on scaled maps, and find/mark and measure bearings b. Use the standard ruler and compass constructions to; bisect a given angle, construct a perpendicular to a given line from/at a given point, construct angles of 90°, 45°, perpendicular bisector of a line segment c. Construct; a region bounded by a circle and an intersecting line, a given distance from a point and a given distance from a line, equal distances from two points or two-line segments, regions which may be defined by 'nearer to' or 'greater than' d. Use constructions to solve loci problems including with bearings	492 – 496 869 661 - 663 664, 665 674 - 678 679	Angles & Bearings Construction Loci
Vectors and geometric proof (18) a. Represent vectors, combinations of vectors and scalar multiples in the plane pictorially b. Calculate the sum of two vectors, the difference of two vectors and a scalar multiple of a vector using column vectors (including algebraic terms). c. Understand that 2**a** is parallel to **a** and twice its length, and that **a** is parallel to –**a** in the opposite direction d. Find the length of a vector using Pythagoras' Theorem. e. Solve geometric problems in 2D where vectors are divided in a given ratio	622 - 627 628 - 636	Vectors Vectors 2 Vector proof

Reciprocal and Exponential graphs (19a) a. Recognise, sketch and interpret graphs of the reciprocal function with $x \neq 0$ b. Recognise, sketch and interpret graphs of exponential functions $y = kx$ for positive values of k and integer values of x; c. Set up, solve and interpret the answers in growth and decay problems d. Estimate area under a quadratic or other graph by dividing it into trapezia e. Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs calculating speed, distance and acceleration f. Interpret the gradient of a linear or non-linear graph in financial contexts and in real-life contexts	300 - 302 800 – 801 891 – 893 889 884 - 885	Sketch Other graphs Speed graphs

Summer Term

The examination for this course is in this term. Paper 1, which is non-calculator is around the end of May. Papers 2 and 3 are calculator papers. Students will have completed at least 1 mock as well as several past papers and these highlight areas to improve as well as improving exam technique.

Outline of Key Learning	Unit Code
Exam technique & practice a. Revisit prior knowledge and apply to exam questions. b. Reflect on areas of weakness and improve them	ALL