Beths Grammar School KS5 Further Maths Curriculum Map – Year 12 Core Pure

A Level Further Maths, Core Pure Year 1

Exam Board: Edexcel

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Term	INTENT	IMPLEMENTATION	IMPACT
	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	**Disciplinary Knowledge (Skills)** This is the action taken within a particular topic in order to gain substantive knowledge.	**Assessment opportunities** What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.
Autumn Term 1A Year 12	Year 1 A level content	See A level Curriculum Map	
Autumn Term 1B Year 12	Year 1 A level content	See A level Curriculum Map	
Spring Term 2A Year 12	Year 2 A level content	See A level Curriculum Map	
Spring Term 2B Year 12	Year 2 A level content	See A level Curriculum Map	
Summer Term 3A Year 12	Core Pure 1 Chapter 1: Complex Numbers • 1.1 Imaginary and complex numbers • 1.2 Multiplying complex numbers • 1.3 Complex conjugation • 1.4 Roots of Quadratic equations • 1.5 Solving cubic and quartic equations	Chapter 1: Complex numbers • Understand and use the definitions of imaginary and complex numbers • Add and subtract complex numbers • Understand the definition of a complex conjugate • Divide complex numbers • Solve quadratic equations that have complex roots • Solve cubic or quartic equations that have complex roots Chapter 2: Argand diagrams	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Chapter revision exercise via textbook • End of term review exercises via textbook • End of term formal mixed chapter assessment

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	<u>Chapter 2: Argand Diagrams</u> • 2.1 Argand diagrams • 2.2 Modulus and argument • 2.3 Modulus-argument form of complex numbers • 2.4 Loci in the Argand diagram • 2.5 Regions in the Argand diagram	• Show complex numbers on an Argand diagram • Find the modulus and argument of a complex number • Write a complex number in modulus-argument form • Represent loci on an Argand diagram • Represent regions on an Argand diagram	
	<u>Chapter 3: Series</u> • 3.1 Sums of natural numbers • 3.2 Sums of squares and cubes	<u>Chapter 3: Series</u> • Use standard results for $\sum_{r=1}^{n} 1$ and $\sum_{r=1}^{n} r$ • Use standard results for $\sum_{r=1}^{n} r^2$ and $\sum_{r=1}^{n} r^3$ • Evaluate and simplify series of the form $\sum_{r=1}^{n} f(r)$, where $f(r)$ is linear, quadratic or cubic	
	<u>Chapter 6: Matrices</u> • 6.1 Introduction to matrices • 6.2 Matrix multiplication • 6.3 Determinants • 6.4 Inverting a 2 x 2 matrix • 6.5 Inverting a 3 x 3 matrix • 6.6 Solving systems of equations using matrices	<u>Chapter 6: Matrices</u> • Understand the concept of a matrix • Define the zero and identity matrices • Add and subtract matrices • Multiply a matrix by a scalar • Multiply matrices • Calculate the determinant of a matrix • Find the inverse of a matrix • Use matrices to solve systems of equations • Interpret simultaneous equations geometrically	

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	Chapter 7: Linear Transformations • 7.1 Linear transformations in two dimensions • 7.2 Reflections and rotations • 7.3 Enlargements and stretches • 7.4 Successive transformations • 7.5 Linear transformations in three dimensions • 7.6 The inverse of a linear transformation	Chapter 7: Linear transformations • Understand the properties of linear transformations and represent them using matrices • Perform reflections and rotations using matrices • Carry out enlargements and stretches using matrices • Find the coordinates of invariant points and the equations of invariant lines • Carry out successive transformations using matrix products • Understand linear transformations in three dimensions • Use inverse matrices to reverse linear transformations	
Summer Term 3B Year	Chapter 4: Roots of polynomials • 4.1 Roots of a quadratic equation • 4.2 Roots of a cubic equation • 4.3 Roots of a quartic equation • 4.4 Expressions relating to the roots of a polynomial • 4.5 Linear transformations of roots Chapter 5: Volumes of revolution • 5.1 Volumes of revolution around the x -axis • 5.2 Volumes of revolution around the y -axis • 5.3 Adding and subtracting volumes • 5.4 Modelling with volumes of revolution	Chapter 4: Roots of polynomials • Derive and use the relationships between the roots of a quadratic equation • Derive and use the relationships between the roots of a cubic equation • Derive and use the relationships between the roots of a quartic equation • Evaluate expressions relating to the roots of polynomials • Find the equation of a polynomial whose roots are a linear transformation of the roots of a given polynomial Chapter 5: Volumes of revolution • Find the volume of revolution when a curve is rotated around the x -axis • Find the volume of revolution when a curve is rotated around the y -axis • Find more complicated volumes of revolution • Model real life objects using volumes of revolution	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Chapter revision exercise via textbook • End of term review exercises via textbook • End of term formal mixed chapter assessment

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	Chapter 8: Proof by induction • 8.1 Proof by mathematical induction • 8.2 Proving divisibility results • 8.3 Proving statements involving matrices Chapter 9: Vectors • 9.1 Equation of a line in three dimensions • 9.2 Equation of a plane in three dimensions • 9.3 Scalar product • 9.4 Calculating angles between lines and planes • 9.5 Points of intersection • 9.6 Finding perpendiculars	Chapter 8: Proof by induction • Understand the principle of proof by mathematical induction and prove results about sums of series • Prove results about divisibility using induction • Prove results about matrices using induction Chapter 9: Vectors • Understand and use the vector and Cartesian forms of the equation of straight line in three dimensions • Understand and use the vector and Cartesian forms of the equation of a plane • Calculate the scalar product for two 3D vectors • Calculate the angle between two vectors, two lines, a line and a plane, or two planes • Understand and use the scalar product form of the equation of a plane • Determine whether two lines meet and determine the point of intersection • Calculate the perpendicular distance between two lines, a point and a line, or a point and a plane	