Year 12 Further Mathematics Curriculum Map

Half Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Big Themes	Complex Numbers Argand Diagrams Matrices Linear Transformations	Roots of Polynomials Vectors Series Proof Volumes of Revolution	Discrete Random Variables Poisson Distribution Momentum and Impulse Work, Energy and Power	Hypothesis testing Chi-Squared Tests Elastic Collisions in One Dimension	Revision External AS Exams	Revision Internal End of Year Exams Complex Numbers Method of differences & Maclaurin Series
Knowledge and skills covered	**Core Pure 1 Chapters 1,2,6,7** ● Complex numbers - multiplying, conjugation, roots of quadratics, cubics, quartics ● Argand diagrams - modulus and argument form, loci in the argand diagram, regions ● Matrices - multiplication, determinants, inverting 2x2 and 3x3, simultaneous equations, modelling ● Transformations - in 2D, reflection and rotation, in 3D, inverses	**Core Pure 1 Chapters 3,4,5,8,9** ● Roots - of quadratics, cubics, quartics, expressions and transformations ● Vectors - equations of lines and planes in 3D, scalar product, angles between lines and planes, points of intersection and perpendiculars ● Series - sums of natural numbers, sums and squares of cubes ● Proof - induction, divisibility results, matrix statements ● Volumes - around the x-axis, around the y-axis, adding and subtracting volumes, modelling	**Further Statistics 1 Chapters 1,2** ● DRVs - expected value, variance, functions of DRVs, problem solving ● Poisson - modelling, adding PDs, mean and variance of PDs and Binomial distributions, approximation **Further Mechanics 1 Chapters 1, 2** ● Momentum - in one direction, conservation of momentum ● Work - work done, kinetic and potential energy, conservation of mechanical energy, work energy principle, power	**Further Statistics 1 Chapters 4,6** ● Hypothesis tests - for the mean of a Poisson distribution, finding critical regions for a PD ● Chi-squared - goodness of fit, degrees of freedom, testing hypothesis, contingency tables **Further Mechanics 1 Chapters 3** ● Elastic collisions - direct impact, restitution, smooth planes, loss of kinetic energy, successive direct impacts	**CP1** **Further Stats 1** **Further Mechanics 1**	**Core Pure 2 Chapters 1,2** ● Complex numbers - de Moivre's theorem, know and use $z = re^{i\theta}$, nth roots, complex roots of unity ● Differences - summation of series using partial fractions, maclaurin series of a function including the general term, when series are valid for common functions

Knowledge organisers and more detailed topic resources can be found on all student Google Classrooms