Curriculum Map –Maths – Year 13

Immanuel College
Church of England Academy

	Term 1		Term 2		Term 3	
Content title **Pure** **Statistics** **Mechanics**	P3. Sequences and series (9 hrs) P4. Binomial expansion (4 hrs) P5. Radians (6 hrs) S&M1. Regression and correlation (6 hrs) S&M3. Normal distribution (8 hrs) (this topic may run into autumn 2)	P6. Trig Functions (6 hrs) P7. Trig and Modelling (8 hrs) P8. Parametric Equations (6 hrs) S&M4. Moments (6 hrs) S&M5. Forces and frictions (4 hrs)	P9. Differentiation (11 hrs) P10. Numerical Methods (5 hrs) S&M6. Projectiles (5 hrs) S&M7. Applications of Forces (7 hrs)	P11. Integration (12 hrs) P12. Vectors (5 hrs) S&M8. Further Kinematics (6 hrs)	Catch up and revision	EXAM
Purpose of the scheme	The mathematics curriculum at Immanuel College is designed to ensure that all students have a secure knowledge base and cultivate a deep understanding of mathematical concepts and procedures, as well as the ability to apply these to a variety of problems, including those they may face in the real world.					
Pre-read (suggested)	Sequences, exponentials (unit 14), Binomial expansion (unit 8), partial fractions (unit 1), trig equations and identifies (unit 10), Mutually exclusive (unit 5), independent (unit 5), probability (unit 5), statistical distributions (unit 6)	Trig identities (chapter 10), radians (chapter 5), trig functions (chapter 6), rearranging equations, logs (unit 14), equation of a circle (unit 6), functions and graphs (unit 2), trig modelling (unit 7) Sohcahtoa, forces and motion (unit 10)	Differentiation (unit 12), parametic equations (unit 8), trig functions (unit 6), Functions, differentiation (unit 9), series (unit 3) Constant acceleration (unit 9), forces and motion (unit 10), sohcahtoa, Forces and motion (unit 5), moments (unit 4)	Differentiation (unit 9), integration (unit 13), algebraic methods (unit 1), vectors (unit 11) Vectors (unit 11), constant acceleration (unit 9), differentiation (unit 9), integration (unit 11)		•
Key knowledge and skills	• Arithmetic sequences • Arithmetic series • Geometric sequences • Geometric series • Sum to infinity • Sigma notation • Recurrence relations • Modelling with series • Binomial expansion • Using partial fractions • Radian measure • Arc length • Areas of sectors and segments • Solving trig equations • Small angle approximations • Exponential models • Measuring correlation • Hypothesis testing for zero Correlation • Normal distribution • Finding probabilities • Inverse normal distribution • Standard normal	• Secant, cosecant, cotangent • Graphs of trig functions • Using sec, cosec and cot • Trig identities • Inverse trig functions • Addition formulae • Using angle addition formulae • Double angle formulae • Solving trig equations • Simplifying • Proving trig identities • Modelling • Parametric equations • Using trig identities • Curve sketching • Points of intersection • Modelling • Moments • Resultant moments • Equilibrium • Centres of mass • Tilting	• Differentiating sine and cos • Differentiating exponentials and logs • Chain rule • Product rule • Quotient rule • Differentiating trig functions • Parametric differentiation • Implicit differentiation • Using second derivatives • Rates of change. • Locating roots • Iteration • The newton Raphson method • Applications to modelling • Horizontal projection • Horizontal and vertical components • Projection at any angle • Projectile motion formulae Static particles • Modelling with statics • Friction and static particles	• Integrating standard functions • Integrating f(ax+b) • Using trig identities • Reverse chain rule • Integration by substation • Integration by parts • Partial fractions • Finding area • Trapezium rule • Solving differential equations • Modelling differential Equations • 3D Coordinates • Vectors in 3D • Solving geometric problems • Application to mechanics • Vectors in kinematics • Vector methods with projectiles • Variable acceleration in 1 dimension • Differentiating vectors		

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	• Finding mean and standard deviation • Approximating binomial distribution • Hypothesis testing with normal	• Resolving forces • Inclined planes • Friction	• Static rigid bodies • Dynamics and inclined planes • Connected particles	• Integrating vectors		
Key words / vocabulary	See above					
Exam board	Edexcel					
End point	Confidence in chapters covered					
Assessment method	Topic Assessments Homework Induction assessment	Topic Assessments Homework Assessment point 1	Topic Assessments Homework Assessment point 2	Topic Assessments Homework	Topic Assessments Homework A2 exam	Topic Assessments Homework
Wider links	Introduction to Mathematical Philosophy by Bertrand Russell A Mathematician's Apology by G. H. Hardy Thinking About Mathematics by Stewart Shapiro	Fermat's Last Theorem by Simon Singh The Millenium Problems by Keith Devlin Journey Through Genius: The Great Theorems of Mathematics by William Dunham The Equation That Couldn't Be Solved by Mario Livio	Kepler's Conjecture by George Szpiro Poincaré's Prize by George Szpiro The Music of the Primes by Marcus du Sautoy Four Colors Suffice by Robin Wilson	Concepts in Modern Mathematics by Ian Stewart Geometry for Dummies by Mark Ryan Concise Introduction to Pure Mathematics by Martin Liebeck Mathematical Methods for Science Students by G Stephenson	The Emperor's New Mind by Roger Penrose The Mathematical Universe by William Dunham The Wonders of Numbers by Clifford Pickover From Here to Infinity by Ian Stewart The Art of the Infinite: Our Lost Language of Numbers by Robert Kaplan	The Number Devil: A Mathematical Adventure by Hans Magnus Enzensberger Art of the Infinite by Kaplan Imagining Numbers: Particularly the Square Root of Minus Fifteen by Barry Mazur A Very Short Introduction to Mathematics by Timothy Gowers
Career links	https://www.mathscareers.org.uk/ Visit the webpage above for links to careers involving Maths and Further Maths.					