

**Edron Maths Department**  
**Maths Studies Core Syllabus**

(for further details please refer to individual IB syllabi)

<b>Introduction to the GDC</b>	
	Arithmetic calculations, use of the GDC to graph a variety of functions
	Appropriate choice of window, use of zoom and trace (or equivalent) to locate points to a given accuracy
	Explanations of commonly used buttons
	Entering data in lists

<b>Number and Algebra</b>	
	Sets of Numbers
	Approximation: decimal places, sig. figs., rounding errors, percentage errors (including an awareness that errors can be induced by premature rounding and an ability to gauge the reasonableness of results).
	The exponential expression, powers and roots using a calculator
	Standard form, SI, using a calculator
	Estimation
	Arithmetic sequences and series
	Geometric sequences and series
	Solutions of quadratic equations using factorising and use of GDC.

<b>Sets, Logic and Probability</b>	
	Basic concepts of set theory
	Venn diagrams and simple applications
	Basic concepts of symbolic logic
	Compound statements, translation between verbal statements, symbolic form and Venn diagrams, implication, equivalence, negation, conjunction, disjunction, exclusive disjunction.
	Truth tables with a maximum of three propositions to provide proofs for the properties of connectives. Concepts of logical contradiction and tautology.
	Implication (converse, inverse, contrapositive) and logical equivalence
	Testing the validity of simple arguments
	$P(A)$ , $P(A')$ , sample space event
	Venn diagrams, tree diagrams, tables of outcomes, solution of problems using “with replacement” and “without replacement”
	Laws of probability, combined events, mutually exclusive events, independent events, conditional probability.

<b>Functions</b>	
	Concept of a function, domain and range, mapping diagrams
	Linear functions and their graphs
	The graph of the quadratic function
	Graphs and properties of exponential functions, growth and decay.
	Graphs and properties of the sine and cosine functions, amplitude and period
	Accurate graph drawing
	Use of a GDC to sketch and analyse simple, unfamiliar functions and combinations of functions.

<b>Geometry and Trigonometry</b>	
	Coordinates in two and three dimensions, distances between points.
	Equation of a line in two dimensions ( $y=mx+c$ and $ax +by = d$ ), gradient, intercepts, intersections of lines, parallel and perpendicular lines
	Right-angled trigonometry, use of sine, cosine and tangent ratios
	Sine rule, cosine rule and formula for area of a triangle. Construction of labelled diagrams from verbal statements
	Geometry of three dimensional shapes (cuboid, prism, pyramid, cylinder, sphere, hemisphere, cone) Lengths and angles found in rectangular prisma and square based pyramids

<b>Statistics</b>	
	Discrete and continuous data
	Simple discrete data, frequency tables, frequency polygons
	Grouped discrete or continuous data, frequency tables, frequency histograms, frequency density histograms, stem and leaf diagrams
	Cumulative frequency tables and curves, percentiles and quartiles, box and whisker plots
	Measures of central tendency for simple discrete(mean, median, mode) and grouped discrete and continuous data(approx. mean, modal group, median).
	Measures of dispersion: range, interquartile range, standard deviation
	Scatter diagrams, line of best fit, by eye, passing through the mean point, interpretation of positive, negative and zero correlations, correlation coefficient.
	Line of regression (straight line)
	The test for independence, formulation of null and alternative hypotheses, significance, contingency tables, expected frequencies, degrees of freedom, p values(one tail test only).

<b>Introductory differential calculus</b>	
	Gradient between two points that lie on the graph of a function, behaviour of the gradient between two points, tangent to a curve
	Differential of polynomials
	Gradients of curves for given values of x, values of x where $f'(x)$ is given, equation of the tangent at a given point.
	Increasing and decreasing functions. Graphical interpretation of $f'(x) > 0$ , $f'(x) < 0$ , $f'(x) = 0$
	Values of x where the gradient of a curve is 0, solution of $f'(x)=0$ Local max and min points.

<b>Financial mathematics</b>	
	Currency conversions (including commission)
	Simple interest
	Compound interest including depreciation
	Construction and use of tables, loan and repayment schemes, investment and saving schemes, inflation.