Landau Learner Curriculum Overview

Subject: Further Mathematics   **Director of Learning: Mr R Bathew**   **Year: 12**

Curriculum organisation
Students are taught in a discrete Further Mathematics group but are likely to have different AS Mathematics staff and may be in different AS Mathematics groups. Students are taught by two learning tutors for the equivalent of 10 single lessons per fortnight.

What topics will students be studying this year? Includes links to National Curriculum, Curriculum Intent and Prior Related Learning*

Term 1:	Term 2:	Term 3:	Term 4:	Term 5:

Pure:
• Complex Numbers Arithmetic
• Argand Diagrams
• Loci of complex numbers
• Sum and product of roots of a polynomials
• Matrices Arithmetic
• Representation of transformations
• Invariant Points & lines
	Pure:
	• Series notation
	• Method of Differences
	• Graphs of rational functions
	• Solving inequalities
	• Parabolas, Hyperbolas and ellipses
		Pure:
		• Vector and Cartesian equation of a line
		• Scalar product
		• Intersection of lines & perpendicular distance
		• Mean of a function
		• Volume of revolution
		• Proof by Induction
			Pure:
			• Logarithms and Exponentials
			• Maclaurin series
			• Definitions and graphs of hyperbolic functions
			• Hyperbolic identities
			• Polar coordinates
				Calculus from the A-Level Mathematics specification to cover the required knowledge for A-Level Further Mathematics in Year 13.
				• Differentiation
				  o Chain Rule, product and quotient rules
				  o Implicit
				  o Trigonometric, exponential and logarithmic functions
				• Integration
				  o Trigonometric, exponential and logarithmic functions
				  o Integration by substitution
				  o Integration by parts
				  o Integration using trigonometric identities

Discrete: • Networks • Minimum spanning trees • Route inspection problem • Graph theory • Euler's formula	Discrete: • Network flows • Linear programming / optimisation problems • Critical path analysis • Game theory • Binary operations	Statistics: • Discrete random variables • Continuous random variables • Poisson Distribution	Statistics: • Confidence intervals • Type I / Type II errors from hypothesis testing • Chi-squared test for association	

Equipment needed for sessions:	What can you do to support your child?
• Mathematics exercise book • Further mathematics text book for Pure, Discrete and Statstics • Scientific calculator with statistical tables lookup function e.g. Classwiz	• Encourage them to complete the homework tasks they are set by their Further Mathematics tutors to a high standard, asking them to show you the finished work • Encourage to seek help from their Learning Tutors in study sessions when needed

How will learning be assessed and progress measured?	Extension and enrichment activities:
• Marking of written work is carried out on a regular basis in line with the College policy • Regular class tests when students have covered a topic • Trial Examinations and VIVAS throughout the year • Regular self-marking	• Post-16 Maths Clinic – Every Tuesday • Senior Mathematical Challenge/ Senior Team Maths Challenge • Additional Maths Support Programme (AMSP) national courses • ERNI mentoring of younger students