Landau Learner Curriculum Overview

Subject: Further Mathematics **Director of Learning: Mr R Bathew** **Year: 13**

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: • Differential equation -method of integrating factor • Differential equations, auxiliary equation – homogenous, non-homogenous • Differential equations – Simple and damped harmonic motion • Differential equations – Systems of Des • Differential equations – Numerical methods • Method of Differences (inc partial fractions) • Maclaurin series, general form • L'Hopital's rule • Modulus of Functions • Oblique Asymptotes • Domain & Range • Conic transformations	Statistics: • Functions of form aX^b • Type I and Type II errors, power of test • Cumulative pdfs • Rectangular distribution • Yates' Correction • Exponential Distribution • T-distribution Discrete: • Kuratowski's Theorem • Isomorphisms • Network Flows -Upper and Lower capacities, flow augmentation • Simplex Algorithm – Linear Prog & Applications to Game Theory • CPA – GANTT charts and resource optimisation • Group Theory – Axioms of groups • Group Theory – Lagrange's Thrm Group Theory – Generators and Isomorphic groups	Pure: • De-Moivre's Theorem • Complex numbers – roots of equations • Matrices – Factorisation of determinants • Matrices – Inverses of 3x3 • Scalar product • Matrices – Eigenvectors and Eigenvalues • Improper Integrals • Trigonometry – Inverse trigonometrical substitutions • Hyperbolics – Reciprocal hyperbolic equations & Identities • Hyperbolics – Inverse hyperbolic substitutions perpendicular distance	Pure: • Vectors – Equation of a plan • Vectors – Vector product • Vectors – Intersection of lines and planes, angle between planes • Arc length and Surface area • Reduction Formulae • Limits of Integration • Area enclosed by a polar curve • Revision for external examinations	

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