

## Further Mathematics A Level (Edexcel)

### Programme of Study:

#### Year 1 - Core Pure

- Complex Numbers
- Argand Diagrams
- Series
- Roots of Polynomials
- Volumes of Revolution
- Matrices
- Linear Transformation
- Proof by Induction
- Vectors

#### Year 1 - Decision

- Algorithms
- Graphs and Networks
- Algorithms on Graphs
- Route Inspection
- Linear Programming
- Critical Path Analysis
- Allocation Problems
- Flows in Networks 1
- Game Theory
- Recurrence Relations

#### Year 2 - Core Pure

- Complex Numbers
- Series
- Methods in Calculus
- Volumes of revolution
- Polar Coordinates
- Hyperbolic Functions
- Methods in Differential Equations
- Modelling with differential equations

#### Year 2 - Decision

- The Travelling Salesman Problem
- The Simplex Algorithm
- Transportation Problems
- Flows in Networks 2
- Dynamic Programming
- Game Theory (cont)
- Decision Analysis

### Assessment

- Paper 1 (Pure) - 1.5 hours - 75 Marks
- Paper 2 (Pure) - 1.5 hours - 75 Marks
- Paper 3 (Decision 1) - 1.5 hours - 75 Marks
- Paper 4 (Decision 2) - 1.5 hours - 75 Marks

Assessments will be designed to reward students for demonstrating the ability to provide responses that draw together different areas of their knowledge, skills and understanding from across the full course of study for the AS further mathematics qualification and also from across the AS Mathematics qualification. Problem solving, proof and mathematical modelling will be assessed in further mathematics in the context of the wider knowledge which students taking A level further mathematics will have studied.

### Entry Requirements

Students are expected to have achieved a Grade 8+ in GCSE Mathematics

### Recommended Reading

- "A Slice of Pi" by Liz Strachan
- "The Shoelace Problem and Other Puzzles" by Ivan Moscovich
- "Numberpedia" by Herb Reich
- "Why Maths Isn't Boring: An exploration of mathematical curiosities" by Daniel Cove
- "Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy" by Cathy O'Neil

**Subject Enrichment** - Senior Maths Challenge (Individual and Team), Chess Club, Maths Masterclasses, Maths Prefects / Supporting KS3 and KS4

### Higher Education and Career Pathways

Various University Opportunities / Apprenticeships

Possible Careers – Engineering, Architect, Financial Analyst, IT Specialist, Teacher, Physicist, Meteorologist and many more

**Complimentary Subjects** – Physics, Computer Science, Economics and Chemistry