Further Mathematics

What will I need before taking this course?

A Grade 8 or above in GCSE Mathematics to take Further Mathematics. All pupils are required to attend the "Introduction to A Level Mathematics" lesson, which will take place during the Sixth Form Induction Day at the end of June 2019. All pupils are required to complete the "Head Start to A Level Further Maths" work book as preparation for the course. This strengthens the Grade 8/9 material in the GCSE syllabus which is an essential prerequisite of the course.

Assessment and Grading

This is a two year course with all examinations at the end of the two years.

Paper 1 - 90 mins (25%)
Paper 2 - 90 mins (25%)
Paper 3 - 90 mins (25%)
Paper 4 - 90 mins (25%)

How will I learn?

Lessons include theory and practice, problem solving and group work. Being able to talk through set questions and solutions with classmates is highly desirable and students should aim to be independent learners and committed to working through practice questions. A formal assessment will be completed after each chapter of work to ensure there is thorough understanding and help identify any misconceptions. You need an ability to think clearly and produce systematic solutions. The work needs to be covered at a regular and steady pace, since the topics are inter-dependent. There is some written work with Statistics but on the whole, the subject provides a good contrast to heavily essay-based subjects.

What will I learn?

Paper 1: Core Pure Mathematics 1
Proof, complex numbers, matrices, algebra and functions, calculus, vectors.

Paper 2: Core Pure Mathematics 2
Complex numbers, algebra and functions, calculus, polar coordinates, hyperbolic functions, differential equations.

Paper 3: Further Mathematics Option 1
Students take one of the following four options:

- **Further Pure Mathematics 1** - Differential equations, coordinate systems, vectors, inequalities.
- **Further Statistics 1** - Linear regression, statistical distributions, correlation, hypothesis testing, chi squared tests.
- **Further Mechanics 1** - Collisions, centres of mass, work and energy, elastic strings and springs.
- **Decision Mathematics 1** - Algorithms and graph theory, critical path analysis, linear programming.

Paper 4: Further Mathematics Option 2
Students take one of the following four options:

- **Further Pure Mathematics 2** - Groups, further calculus, further matrix algebra, further complex numbers, number theory, further sequences and series.
- **Further Statistics 2** - Probability distributions, combinations of random variables, estimation, confidence intervals and tests using a normal distribution, Other hypothesis tests and confidence intervals, Other hypothesis tests and confidence intervals, probability generating functions, quality of tests and estimators.
- **Further Mechanics 2** - Further kinematics, further dynamics, motion in a circle, statics of rigid bodies, elastic collisions in two dimensions.
- **Decision Mathematics 2** - Transportation problems, allocation (assignment) problems, flows in networks, dynamic programming, game theory, recurrence relations, decision analysis.

AWARDING BODY	Edexcel
CONTACT FOR FURTHER DETAILS	Mrs Cousins-Roach—Acting Head of Mathematics