

## POST 16 SUBJECT OVERVIEW

### Post 16 Subject Overview

#### Name of Subject

A Level Further Mathematics

#### Which Examination Specification is Studied for this Course?

AQA

#### Why should I study this course?

Are you considering studying mathematics (or a highly numerate subject) at degree level? Are you the type of person who questions why something is true or how certain mathematical methods came about? If so, then Further Mathematics may be the course for you. We will study different types of mathematics: from imaginary numbers and hyperbolic functions to conics and matrices. You will also have the chance to study further topics in statistics and discrete mathematics - the study of networks, graphs and game theory. You will need excellent algebra skills and a deep interest in mathematics. To study this qualification you must also study A Level Mathematics.

#### What GCSE Qualifications Support the Study of this Course?

GCSE Mathematics (essential)

GCSE Statistics

L2 Certificate in Further Mathematics

#### What are the Qualification Requirements for this Course?

Minimum of a Grade 8 in GCSE Mathematics with very strong algebraic manipulation skills.

#### How is the Course Delivered?

The course is usually shared between two teachers, with 4 hours of lessons per week. Students are expected to spend at least 5 hours per week doing independent study. The course is delivered via a mixture of theory, examples and practice: a similar style to what students will be used to from GCSE study. Students will make use of Google Classroom to study relevant materials, submit homework assignments and review their feedback.

## Subject Overview

Half Term	Year 12	Year 13
<b>Autumn 1</b>	<ul style="list-style-type: none"> <li>• Complex numbers</li> <li>• Matrices</li> <li>• Roots of polynomials</li> <li>• Polar coordinates</li> </ul>	<ul style="list-style-type: none"> <li>• Further complex numbers</li> <li>• Further matrices</li> <li>• Further calculus</li> <li>• Vector equations of planes</li> </ul>
<b>Autumn 2</b>	<ul style="list-style-type: none"> <li>• Series</li> <li>• Rational functions</li> <li>• Statistics: discrete random variables, Poisson distribution, hypothesis testing errors</li> </ul>	<ul style="list-style-type: none"> <li>• Numerical methods</li> <li>• Series</li> <li>• Modulus and rational functions</li> <li>• Conics</li> <li>• Discrete: further graphs, networks and critical path analysis</li> <li>• Statistics: discrete and continuous random variables, hypothesis testing errors</li> </ul>
<b>Spring 1</b>	<ul style="list-style-type: none"> <li>• Further calculus</li> <li>• Discrete: graphs, networks, critical path analysis, linear programming</li> <li>• Statistics: continuous random variables, chi-squared tests, confidence intervals</li> </ul>	<ul style="list-style-type: none"> <li>• Discrete: simplex algorithm, further game theory, further group theory</li> <li>• Statistics: Yate's correction, exponential distribution, t-distribution, further confidence intervals</li> </ul>
<b>Spring 2</b>	<ul style="list-style-type: none"> <li>• Proof by induction</li> <li>• Vector equations of lines</li> </ul>	<ul style="list-style-type: none"> <li>• Further polar coordinates</li> <li>• Further hyperbolic functions</li> <li>• Differential equations</li> </ul>
<b>Summer 1</b>	<ul style="list-style-type: none"> <li>• Hyperbolic functions</li> <li>• Discrete: game theory, group theory</li> </ul>	<ul style="list-style-type: none"> <li>• Revision</li> </ul>
<b>Summer 2</b>	<ul style="list-style-type: none"> <li>• Revision</li> </ul>	<ul style="list-style-type: none"> <li>• Revision</li> </ul>

### **How is the Course Assessed?**

Assessment is by examinations. There are three papers, taken at the end of year 13: two pure papers and one applied paper (statistics and discrete). Each paper is 2 hours and worth 100 marks (equally weighted). Regular Praising Stars assessments will take place on specific topics to help provide an indication of attainment and provide feedback for students to allow them to improve. Students may take AS Level Further Mathematics at the end of Year 12 if they wish.

### **What is our Recommended Subject Reading list to Support your Study?**

Any new specification (2017 or newer) A Level Further Mathematics textbook would be a helpful companion guide to the course; we aim to provide textbooks for students where possible. Our specification is AQA.

