Syllabus 9709 AS Mathematics – Papers P1 (Pure Mathematics) and S1 (Probability and Statistics 1)

Recommended Prior Knowledge. Students should have achieved at least a grade C at O-level or IGCSE in Mathematics.

General Resources

Cambridge University Press has published a series of textbooks created specifically for the CIE syllabus. The recommended books for this course are :-

- Pure Mathematics 1 ISBN 0 521 53011 3
- Statistics 1 ISBN 0 521 53013 X

Internet sites. There are a number of appropriate sites covering both this and the later A2 syllabus. Those general sites that can be recommended are:-

- AS Guru (www.bbc.co.uk/education/asguru/maths) – an excellent site published by the BBC aimed specifically at students taking AS examinations.
- BBC GCSE Bitesize (www.bbc.co.uk/schools/gcsebitesize/maths) – a comprehensive, pupil friendly revision site for students taking AS mathematics with only grade C at O level or IGCSE.
- Autograph - Graph Plotter (www.chartwellyorke.com/autograph.html) . A revolutionary aid to the teaching of calculus and coordinate geometry.

UNITS

1 P1	**Algebra**. An in-depth study of functions (Topic 2), including the quadratic function, the solution of simultaneous and quadratic equations (Topic 1) and a study of arithmetic and geometric series (Topic 7). Approximately 20% of the AS course.
2 P1	**Coordinate Geometry and Calculus**. The coordinate geometry of the straight line (Topic3), leading to the gradient of a curve and to the introduction of differentiation (Topic 8) and integration (Topic 9). Approximately 25% of the AS course.
3 P1	**Trigonometry and Vectors**. Radian and Circular Measure (Topic 4) .The graphs of the basic trigonometric functions, identities and equations (Topic 5). Simple vector algebra and the use of vectors to calculate lengths and angles (Topic 6) Approximately 15% of the AS course.
4 S1	**Numerical Statistics**. Representation of data (including histograms and cumulative frequency graphs) and analysis of data (including measures of central tendency and variation) (Topic 1). Permutations and Combinations (Topic 2). Approximately 15% of the AS course.
5 S1	**Probability**. Basic ideas to include exclusive and independent events and conditional probabilities (Topic 3). Probability distributions – to include the study of discrete distributions (including the binomial distribution) (Topic 4) and the continuous distribution (normal distribution only) (Topic 5) Approximately 25% of the AS course.

Please note that the units outlined above are not of equal size. They have been designed to provide coherent topics that will take students through the AS course in a logical and ordered way. A very approximate weighting is given with each unit.

TEACHING ORDER

The order suggested below will vary depending upon the structure of the teaching resources in any one particular school. Two particular teaching structures are catered for;

- A - the situation where one member of staff is teaching the whole course,
- B - the situation where the two components (P1 and S1) are being taught by different members of staff (as in many schools),

Even in case A there will be the occasional topic which will need teaching out of order, simply because of the need for its inclusion in a different unit.

A. Suggested that Unit 1 be taught first to give a good general algebraic background for other units that will follow. However the work on series is independent and could be covered later in the course. Unit 2 should follow – it is the longest and most important part of the syllabus. Units 3,4 and 5 can be taught in any order providing 4 precedes 5.

B. Teacher of Pure maths. Should follow the same order as in "A" (i.e. Units 1,2 and 3 in order) except that the simple principles of differentiation and integration could be introduced at an earlier stage.

Teacher of Statistics. The suggested order of the syllabus i.e. Unit 4 before Unit 5 presents the teacher and student with a logical progression. The two members of staff should however liaise on their teaching of the topics - "binomial series in Unit 1" and "binomial expansion in Unit 4".