

Syllabus 9709 GCE A Level Mathematics - UNIT 07 (Statistics 2)

Recommended Prior Knowledge:

This Unit follows directly from S1, students of S2 must have already studied S1. The A Level course containing S2 consists of Units P1, P3, S1 and S2. The 2 sections should be followed in order, since the work on the Poisson distribution and on the probability density functions are needed for the work on confidence limits and hypothesis testing. The students must have encountered work from Unit P3 on the exponential function prior to starting Section 1, since this knowledge is needed for the work on the Poisson distribution.

General Resources

Cambridge University Press has published a series of textbooks created specifically for the CIE syllabus. The recommended book for this Unit is:-

- Statistics 2 ISBN 0 521 53014 8

Internet sites

There are a number of appropriate sites covering this Unit.

- General – a useful general site for Unit S2 is www.mathsrevision.net which contains general revision notes and interesting facts on various topics within this Unit.
- Specific – suitable sites can be found by searching under specific topics. “Poisson Distribution”, “Hypothesis Testing” and “Type 1 and Type 2 errors” each brings up relevant material, including practical examples, though often beyond the level needed.

SECTIONS

1	Section 1 studies the Poisson distribution, looks at its relation to the binomial distribution and concludes with a study of how it can be approximated by the normal distribution. The Section continues with a study of the mean and variance of linear combinations of two variables. It concludes with an in-depth study of continuous random variables, including the calculation of probabilities, mean, variance and median.
2	Section 2 deals with ideas behind sampling and estimation. It looks at the idea of a sample mean and of how this is normally distributed. It continues with the central limit theorem and moves on to unbiased estimates and confidence intervals. The Section concludes with an introduction to hypothesis testing and the terminology associated with it. The study looks at hypothesis testing with sample means and with a single observation taken from the Poisson or binomial distribution. It concludes with a study of Type 1 and Type 2 errors.

The two Sections are of approximately equal weighting. It is difficult to be more precise than this, since many of the ideas in Section 1 are used in Section 2.