# Subject Guide: Level 3 Certificate in Quantitative Problem Solving

## Change to all A Levels

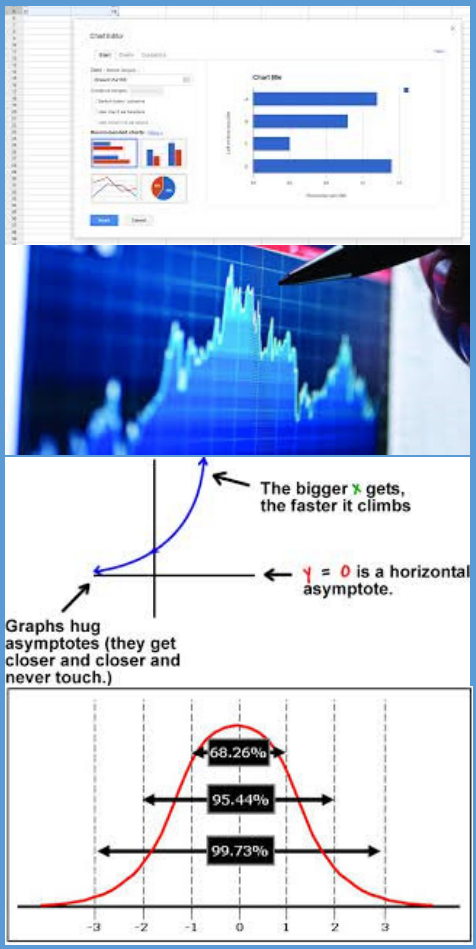
Changes are under way for all A levels in all schools and colleges and some awarding bodies are still revising their syllabuses for 2015. As a result, this guide is an illustration of the content but the exact details may change.

The most significant changes in A Levels and AS exams (but see below for the different timescale in this subject) are:

- All assessment for A Levels will be through end of course exams with no practical element in most subjects.
- There will still be AS as one year "half A Levels" but you won't be able to add an A2 to make them into a full A Level.
- This means if you want a full A Level you will need to decide that at the start of your course.
- You will still be able to combine A Levels with other types of qualifications such as BTECs.
- These changes are happening at different times for different subjects.
- You'll have lots of support from us before you have to make your final choice of subjects.

Specifics for this subject:

**The first teaching is in September 2015 leading to an end of course exam in 2016. This is a "Core Maths" qualification designed for students not taking Maths A Level but who want practical Maths beyond GCSE.**




## What is Quantitative Problem Solving?

This is a new "Core Maths" qualification for students who gained at least a C in GCSE and who want to increase their Maths skills but do not want to study a full Maths A Level. It has been developed in partnership with the Mathematics in Education and Industry (MEI organisation).

The aim is to increase your ability to select appropriate mathematical techniques to analyse and solve specific problems. It is especially useful for students taking A Level or BTEC National courses for which confidence in Maths is an advantage, for example Business, Psychology, Economics, Biology, Chemistry or Computer Science. In many of these subjects, A Level examinations feature problems or case studies where confidence in Maths is an advantage.

The qualification is at Level 3 (A Level standard) and is equivalent in size to an AS (so worth half an A Level). The content includes:

- how to build mathematical models to solve problems;
- how to increase your confidence using and analysing statistics;
- business uses of Maths, e.g. estimation, spreadsheets & risk analysis;
- understanding graphs and diagrams; and
- Making good use of technology to solve problems.

## What GCSEs do I need to study Quantitative Problem Solving?

You need to have gained at least a C in Mathematics at GCSE but not be carrying on with a Maths based A Level such as Maths, Further Maths or Physics. If you have not gained at least a C in Maths GCSE we will normally advise you to resit it.

The Certificate in Quantitative Problem Solving will provide particularly useful support for Economics, Psychology, Business Studies, Biology and Engineering.

SOUTH WILTSHIRE UTC
A UNIVERSITY TECHNICAL COLLEGE

# Level 3 Certificate in Quantitative Problem Solving


## What could I do with it afterwards?

The main value of the Level 3 Certificate is that it will help you across a very wide range of future careers and/or university courses. The course gives you practical problem-solving skills that you will be able to apply immediately to a wide range of contexts. It is also valued by employers and universities in its own right and carries half the UCAS points of a full A Level.

## What form does the assessment take?

There are two end of course exams. One covers quantitative reasoning and tests your understanding of statistical research and model-building. The second covers statistical problem-solving based on interpreting data from real statistical case studies and data sets.

## Course details

### Use of Technology

- Calculators, spreadsheets and formulae
- Building formulae into spreadsheet cells
- Using spreadsheets to solve equations and develop graphs

### Modelling

- Developing simple mathematical models to address a real-world problem
- The modelling cycle (model, predict, analyse outcomes, appraise and improve)
- Estimation to check calculations and set upper and lower boundaries
- Using algebra to develop formulae (e.g. exponentials, trig, rational expressions)
- Geometry in practice (e.g. volume measurements, adhering to regulations, interpreting maps and diagrams and understanding measures of displacement)

### Statistics

- The statistical cycle (assess, collect, process, present and interpret)
- Understand the practical language of data (e.g. sampling, error, measures of central tendency and normal distribution)
- Interpreting and developing statistical diagrams and applying interpretative techniques (e.g. to measure skewness or spread)
- Understanding of statistical methods to correct problems for example weighting.

### Financial Data

- Percentages, indices, exchange rates, cost and profit calculations, inflation etc.

### Exponentials

- Representations of large and small numbers, exponential functions and log scales

### Graphs and Gradients

- Understanding graphs in a variety of contexts, using trigonometry and linear models
- Measuring gradients of straight lines and curves