# Statistics: Statistical Inference (Advanced Higher) Unit

**SCQF:** level 7 (8 SCQF credit points)

**Unit code:** H7VW 77

## Unit outline

The general aim of this Unit is to develop and apply skills in statistical inference. Learners will select and use appropriate statistical models to assist with the analysis of data and interpret results in context, evaluating the strength and limitations of their models. The practicalities of working with sample data to consider possible population distributions and to obtain best estimates of a population mean are introduced. The importance of the distribution of sample means is highlighted, and the power of the central limit theorem is outlined and used to evaluate the accuracy of the estimated population mean. A statistical investigation generated by the learner will be carried out using the skills developed in the Unit.

Learners who complete this Unit will be able to:

1    Use statistical skills linked to statistical inference
2    Carry out a statistical investigation

This Unit is a mandatory Unit of the Advanced Higher Statistics Course and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Course/Unit Support Notes*, which provide advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work. Exemplification of the standards in this Unit is given in *Unit Assessment Support*.

The *Course Assessment Specification* for the Advanced Higher Statistics Course gives further mandatory information on Course coverage for learners taking this Unit as part of the Advanced Higher Statistics Course.

## Recommended entry

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

♦ Higher Mathematics Course

## Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information please refer to the *Course/Unit Support Notes.*

# Standards

## Outcomes and assessment standards

### Outcome 1

The learner will:

**1      Use statistical skills linked to statistical inference by:**

1.1    Applying skills to sampling and the central limit theorem
1.2    Applying skills to intervals and estimation
1.3    Applying skills to bivariate analysis

### Outcome 2

The learner will:

**2      Carry out a statistical investigation by:**

2.1    Specifying the problem and planning the investigation
2.2    Selecting relevant data
2.3    Presenting and analysing the data
2.4    Communicating the conclusion

# Evidence Requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used. They should ensure there is sufficient evidence of competence in mathematical skills from the Outcomes and Assessment Standards to allow a judgement to be made that the learner has achieved the Unit.

Assessors should use their professional judgement when giving learners credit for an appropriate degree of accuracy. This may mean giving credit for incomplete solutions or numerically incorrect solutions which show correct methodology, therefore demonstrating required knowledge and understanding of the mathematical processes involved.

A calculator or equivalent technologies may be used.

For **Outcome 1**, learners will be required to provide evidence for each Assessment Standard linked by drawing on the following methods and concepts:

Skills appropriate to application (1.1)
♦   Identifying and using appropriate random sampling methods
♦   Working with the distribution of sample means and sample proportions

Skills appropriate to application (1.2)
♦   Obtaining confidence intervals
♦   Using control charts

Skills appropriate to application (1.3)
♦ Fitting a linear model to bivariate data
♦ Assessing the linear association between two variables
♦ Estimating with bivariate data

For **Outcome 2**, learners will be required to provide evidence covering each stage of the investigation. Evidence is required for one investigation.

Exemplification of assessment is provided in *Unit Assessment Support*. Advice and guidance on possible approaches to assessment is provided in the *Course/Unit Support Notes.*

# Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

**2      Numeracy**

2.1    Number processes
2.2    Money, time and measurement
2.3    Information handling

**5      Thinking skills**

5.3    Applying
5.4    Analysing and evaluating

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work.* The level of these skills should be at the same SCQF level of the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Course/Unit Support Notes.*

# Administrative information

**Published:**  April 2016 (version 2.1)

**Superclass:**  RB

## History of changes to National Unit Specification

| Version | Description of change | Authorised by | Date |
|---------|----------------------|---------------|------|
| 2.0 | Outcome 2 and Assessment Standards 2.1, 2.2 and 2.3 amended.<br><br>Evidence Requirements relating to Outcome 1 amended. | Qualifications Development Manager | April 2015 |
| 2.1 | Assessment Standard 1.2 amended from 'Applying skills to sampling and the central limit theory' to 'Applying skills to sampling and the central limit theorem'. | Qualifications Manager | April 2016 |
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Note: readers are advised to check SQA's website: www.sqa.org.uk to ensure they are using the most up-to-date version of the Unit Specification.