SQA Advanced Unit Specification

General information

Unit title: Statistics for Business (SCQF level 7)

Unit code: J45Y 47

Superclass: AJ

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Source: Scottish Qualifications Authority

Version: 01

Unit purpose

This unit introduces learners to statistical concepts including descriptive and inferential statistics used in business. The unit will provide learners with the underpinning knowledge and skills required to apply statistical techniques to address business problems using appropriate IT software.

Outcomes

On successful completion of the unit, the learner will be able to:

1 Explain statistical techniques for collecting data.
2 Use statistical techniques to analyse data, interpret data and produce forecasts.
3 Perform hypothesis testing.

Credit points and level

1 SQA unit credit(s) at SCQF level 7: (8 SCQF credit points at SCQF level 7).

Recommended entry to the unit

Entry is at the discretion of the centre, however learners would normally be expected to have achieved a qualification in mathematics at SCQF level 6 or equivalent.

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the **support notes section** for this unit specification.

There is no automatic certification of Core Skills or Core Skill components in this unit.

Context for delivery

If this unit is delivered as part of a group award, it is recommended that it should be taught and assessed within the subject area of the group award to which it contributes.

The Assessment Support Pack (ASP) for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website **(http://www.sqa.org.uk/sqa/46233.2769.html)**.

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.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

Statement of standards

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Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Where evidence for outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Explain statistical techniques for collecting data.

Knowledge and/or skills

- Sources of data
- Data collection methods
- Sampling methods
- Types of data

Outcome 2

Use statistical techniques to analyse data, interpret data and produce forecasts.

Knowledge and/or skills

- Measures of central location and dispersion
- Displaying data
- Scatter diagrams, correlation and forecasting
- Analysis and interpretation of data

Outcome 3

Perform hypothesis testing.

Knowledge and/or skills

- Normal distribution
- Confidence intervals
- Hypothesis testing
- Type 1 and 2 errors

Evidence requirements for this unit

Learners will need to provide evidence to demonstrate their knowledge and/or skills across all outcomes by showing that they can:

Outcome 1 — Explain statistical techniques for collecting data.

A learner's response will be judged satisfactory where the evidence shows that the learner can:

- identify appropriate sources where specified types of data may be found, indicating whether the source is primary or secondary
- identify and explain appropriate methods for data collection
- identify and explain appropriate sampling methods for data collection
- provide clear and accurate definitions of types of data, and provide an example of each

Written and/or oral recorded evidence for outcome 1 will be assessed using a closed-book assessment under supervised conditions. It is recommended that the assessment be completed within 60 minutes.

Outcome 2 — Use statistical techniques to analyse data, interpret data and produce forecasts.

A learner's response will be judged satisfactory where the evidence shows that the learner can:

- calculate appropriate measures of central location and measures of dispersion
- display quantitative, qualitative and ordinal data in appropriate formats
- produce a scatter diagram using appropriate software, and use linear regression and correlation to analyse a suitable problem and produce a prediction using appropriate software
- interpret the results of the analysis, both graphical and numerical, and provide meaningful comment

Written and/or oral recorded evidence for outcome 2 will be assessed using an open-book assessment under supervised conditions. Learners should have access to an appropriate software package to assist in the completion of this outcome. It is recommended that the assessment be completed within 120 minutes.

Where learners are provided with data files, these should contain only the raw data and should not be provided in the form of pre-prepared files containing templates of formulae.

Outcome 3 — Perform hypothesis testing.

A learner's response will be judged satisfactory where the evidence shows that the learner can:

- calculate probabilities using the normal distribution table
- construct a confidence interval appropriate to a given business scenario
- assess a claim against a confidence interval in a given business scenario
- establish an appropriate null hypothesis and alternative hypothesis in given business scenarios
- perform a hypothesis test for a large sample and a small sample for given business scenarios
- explain type 1 and 2 errors in relation to a hypothesis test

Written and/or oral recorded evidence for outcome 3 will be assessed using an open-book assessment under supervised conditions. Learners may have access to an appropriate software package to assist in the completion of this outcome. It is recommended that the assessment be completed within 120 minutes.

Support notes

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Unit support notes are offered as guidance and are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this unit

This unit is designed to provide learners with a knowledge and understanding of descriptive statistics and also an introduction to inferential statistics. Learners will use appropriate IT software to provide analysis and interpretation of quantitative, ordinal and qualitative data.

The unit is aimed at learners studying business and accounting related subjects, but the skills are transferrable to other disciplines such as social sciences, psychology, and other areas for which data gathering and analysis are important.

Some learners may view this unit as a stepping-stone to a more in-depth study of statistics while for others it may be their only experience of the subject.

This unit provides familiarity with the gathering, analysis and interpretation of statistical data. This unit requires, as a prerequisite, a knowledge of mathematics at SCQF level 6, although a strong background at SCQF level 5 could be sufficient. Contexts related to the learner's course of study should be used during both learning and assessment.

The following bullet points give an indication of the content of each outcome. Each outcome is likely to require approximately a third of the available teaching time.

Outcome 1 — Explain statistical techniques for collecting data.

- Sources of data: Primary data and secondary data should be considered, including how to generate data and find data that has already been gathered.
- Data collection methods: These may include observation, online surveys, questionnaires, documentation reviews and experimentation, although other methods can be covered.
- Sampling methods: These may include random, systematic, stratified and quota, although other methods can be covered.
- Types of data: These may include quantitative, qualitative, nominal, ordinal, interval, ratio, discrete and continuous.

Outcome 2 — Use statistical techniques to analyse data, interpret data and produce forecasts.

- Measures of central location and dispersion: Mean, mode, median, standard deviation, quartiles, range and interquartile range.
- Displaying data: Line graphs, pie charts, and bar charts including compound and multiple charts which are commonly used in business scenarios. Emphasis should be placed on selecting appropriate charts for given data sets.
- Scatter diagrams, correlation and forecasting: Line of best fit equation and correlation coefficient. Linear regression forecast, and the accuracy of the forecast should be considered in conjunction with the correlation coefficient.
- Analysis and interpretation of data: Learners should interpret the analysis.

Outcome 3 — Perform hypothesis testing.

- Normal distribution: Using the normal distribution table, areas under the normal distribution table and the probability of events. Use z-scores to calculate probabilities of a sample mean being more than, less than, and between given values.
- Confidence intervals: Common confidence intervals and values.
- Hypothesis testing: Null and alternative hypotheses, testing at different significance levels. One and two tailed z-tests using large samples, and t-tests for small samples about a single mean using common significance levels.
- Type 1 and 2 errors: The meaning of type 1 and 2 errors and their implications.

Consideration of the above content for each outcome alongside the Assessment Support Pack for this unit will provide a clear indication of the standard expected.

Guidance on approaches to the delivery of this unit

This unit provides knowledge and understanding of statistical methods for business and related disciples. All outcomes will involve delivering some theory but where possible a practical activity-centred approach to delivery coupled with the use of IT should be encouraged.

Centres may deliver the outcomes in any order they wish, but it is recommended that outcome 1 is delivered first followed by outcome 2 and then outcome 3.

All teaching input should be supplemented by formative assessment in which learners are provided with opportunities to develop their knowledge, understanding and skills of the statistical knowledge and methods covered in the unit.

If delivered as part of a group award, it is envisaged that this unit will be delivered after the completion of any appropriate IT software units, but sufficiently early to give more meaning to management activities associated with planning and control.

Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The assessment for outcome 1 will have an appropriate and defined error tolerance for each evidence requirement. An appropriate threshold score for attainment will be set for the assessments for outcomes 2 and 3.

An exemplar instrument of assessment with marking guidelines has been produced to indicate the national standard of achievement at SCQF level 7.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this unit. By e-assessment, we mean assessment which is supported by Information and Communication Technology, such as e-testing or the use of e-portfolios or social software. Centres wishing to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment — as specified in the evidence requirements — are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at: www.sqa.org.uk/e-assessment.

Opportunities for developing Core and other essential skills

The delivery and assessment of this unit will provide learners with the opportunity to develop the Core Skill of *Numeracy* at SCQF level 6.

History of changes to unit

Version	Description of change	Date

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of SQA Advanced Qualifications.

Further information

Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000. Alternatively, complete our Centre Feedback Form.

General information for learners

Unit title: Statistics for Business (SCQF level 7)

This section will help you to decide whether this is the unit for you by explaining: what the unit is about; what you should know or be able to do before you start; what you will need to do during the unit; and opportunities for further learning and employment.

This unit will familiarise you with some basic statistical methods used in the business and accounting disciplines, although the skills are transferrable. This unit will also be useful if you are studying other disciplines such as social sciences, psychology, and other areas for which data gathering and analysis are important.

This unit provides familiarity with the gathering, analysis and interpretation of statistical data.

Outcome 1 explains how to find and gather data, including how to establish the best strategy for sampling. A range of different types of data will be explained.

Outcome 2 includes different measures of central location and dispersion of data, and the relationships between data using correlation, and causal forecasting based on data relationships. You will consider different ways of displaying data, as well as possible interpretations of the data after the analysis is complete.

Outcome 3 introduces you to inferential statistics including the normal distribution curve, the use of z-scores to calculate the probability of an event occurring, and finding confidence intervals. You will learn about hypothesis testing (large and small samples), type 1 and type 2 errors and their implications in business scenarios.

As a prerequisite, you should have knowledge of mathematics at SCQF level 6, although a strong background at SCQF level 5 could be sufficient.

Assessment

Assessments will be conducted on an outcome by outcome basis. The outcome 1 assessment will be conducted under closed-book conditions. Assessments for outcomes 2 and 3 will be conducted under supervised open-book conditions with access to appropriate IT software allowed.

Core Skills

The delivery and assessment of this unit will provide you with the opportunity to develop the Core Skill of *Numeracy* at SCQF level 6.