SCOTTISH QUALIFICATIONS AUTHORITY

National Unit Specification: general information

UNIT Statistics (Higher)

NUMBER D325 12

COURSE Mathematics (Higher)

SUMMARY

Statistics (H) is an optional unit of the Higher Mathematics course which is designed to provide a statistics specialism, and to form the basis from which further study of statistics can be developed. Outcome 2 is necessary for the work in Advanced Higher *Statistics 1*, while experience of Outcomes 1 and 4 is advantageous for that work.

OUTCOMES

1 Interpret an Exploratory Data Analysis (EDA) on a data set.
2 Work with discrete probability distributions.
3 Work with continuous probability distributions.
4 Analyse the relationship between two variables.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates will normally be expected to have attained one of the following:

- Standard Grade Mathematics Credit award
- Intermediate 2 Mathematics award or its component units
- equivalent.

In particular the statistical content of *Mathematics 2 (Int 2)* provides an appropriate basis for *Statistics (H)*.

Administrative Information

Superclass: RB

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Version: 03

National Unit Specification: general information (cont)

UNIT Statistics (Higher)

CREDIT VALUE

1 credit at Higher level.

CORE SKILLS

This unit gives automatic certification of the following:

Complete core skills for the unit	Numeracy	H
Additional core skills components for the unit	Critical Thinking	H

Additional information about core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

National Unit Specification: statement of standards

UNIT Statistics (Higher)

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 the Scottish Qualifications Authority.

OUTCOME 1

Interpret an Exploratory Data Analysis (EDA) on a data set.

Performance criteria

a) Interpret the results of an EDA.

OUTCOME 2

Work with discrete probability distributions.

Performance criteria

a) Calculate the probability of an event which involves the laws of probability.
b) Construct the probability distribution of a given random variable.
c) Calculate the mean and variance of a random variable.
d) Simulate the behaviour of a random variable.

OUTCOME 3

Work with continuous probability distributions.

Performance criteria

a) Calculate probability from the density function of a continuous random variable.
b) Obtain the mean and variance of a continuous random variable.

OUTCOME 4

Analyse the relationship between two variables.

Performance criteria

a) Determine the equation of linear regression and use it for prediction.
b) Calculate the correlation coefficient and interpret the result.

Evidence requirements

Although there are various ways of demonstrating achievement of the outcomes, evidence would normally be presented in the form of a closed book test under controlled conditions. Examples of such tests are contained in the National Assessment Bank.

National Unit Specification: support notes

UNIT Statistics (Higher)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the 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

Each mathematics unit at Higher level aims to build upon and extend candidates' mathematical knowledge and skills. This optional unit extends the statistical content of Intermediate 1 and 2, and is designed mainly to provide a statistics specialism at Higher level in acknowledgment of the extensive use of statistical processes in many occupations and other areas of study.

Exploratory Data Analysis (a method of achieving a quick and simple analysis of a sample data set) unifies the inferential statistics contained in *Mathematics 2 (Int 1)* and *Mathematics 2 (Int 2)* in Outcome 1.

In Outcomes 2 and 3, discrete and continuous probability distributions are studied in some depth, allowing for discussion of randomness and simulation. The mathematics of continuous probability functions provide a link with the calculus contained in *Mathematics 2 (H)*.

Outcome 4 formalises and extends the work on scattergraphs at Intermediate 2 level to regression analysis and the calculation of the correlation coefficient.

The recommended content for this unit can be found in the course specification. The *detailed content* section provides illustrative examples to indicate the depth of treatment required to achieve a unit pass and advice on teaching approaches.

Where possible, candidates should be given the opportunity to apply the statistics of this unit through a short statistical assignment which will require them to collect (generate) the relevant data, analyse the data and interpret and communicate the conclusion. This assignment does not require to be formally assessed.

National Unit Specification: support notes (cont)

UNIT Statistics (Higher)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Where appropriate, statistical topics should be taught and skills in applying statistics developed through real-life contexts. Candidates should be encouraged, throughout this unit, to make efficient use of the arithmetical, mathematical, statistical and graphical features of calculators as well as basic non-calculator skills. Candidates should be aware of the limitations of the technology and always apply the strategy of checking.

Numerical checking or checking a result against the context in which it is set is an integral part of every mathematical process. In many instances, the checking can be done mentally, but on occasions, to stress its importance, attention should be drawn to relevant checking procedures throughout the mathematical process. There are various checking procedures which could be used:

- relating to a context – 'How sensible is my answer?'
- estimate followed by a repeated calculation
- calculation in a different order.

Further advice on learning and teaching approaches is contained within the Subject Guide for Mathematics.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

The assessment for this unit will normally be in the form of a closed book test. Such tests should be carried out under supervision and it is recommended that candidates attempt an assessment designed to assess all the outcomes within the unit. Successful achievement of the unit is demonstrated by candidates achieving the thresholds of attainment specified for all outcomes in the unit. Candidates who fail to achieve the threshold(s) of attainment need only be retested on the outcome(s) where the outcome threshold score has not been attained. Further advice on assessment and retesting is contained within the National Assessment Bank.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).