

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
24 Douglas Street
GLASGOW G2 7NQ**

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 0091063 -Session-1989-90

-Superclass- RB

-Title- MATHEMATICS: STATISTICS 1

-DESCRIPTION-

Purpose This module is designed to introduce statistics to the student who is not specialising in mathematics. It provides a suitable prelude to statistical methods appropriate for business or social science studies and deals with the preliminaries of collecting, processing and presenting data.

Refer to the Appendix for guidance on the framework of the mathematics modules.

Preferred Entry Level 81052 Mathematics: Grade 2 (x2) or Standard Grade in Mathematics at 5 or equivalent.

Learning Outcomes The student should:

1. distinguish between methods of data collection;
2. construct and use statistical tables, graphs and charts;
3. calculate simple statistics;
4. complete a project which requires the application of statistical knowledge and skills.

Content/ Context Corresponding to Learning Outcomes 1-4:

1. Different types of data: qualitative and quantitative data, discrete and continuous data; different methods of sampling: random, stratified, cluster, quota, etc; sources of data: published statistics, direct observation, interview, postal questionnaire; characteristics of questionnaires, surveys, censuses.

2. Tabulation of data: frequency table, relative frequency table, cumulative frequency table, stem-leaf chart; charts: pictographs, bar graphs, line graphs, histograms, pie charts; ogives.
3. Measures of central tendency: mode, mean from raw data and from frequency tables, median from frequency tables, ogive. Measures of dispersion: range, semi-interquartile range, variance, standard deviation.
4. The project should involve the application of the content of the other Learning Outcomes.

Suggested
Learning and
Teaching
Approaches

Wherever reasonable the statistical concepts and techniques in this module should be illustrated using real-life examples.

Lengthy computations can be avoided by appropriate use of calculators and computer packages. For example students can more easily use realistic data in projects if they have access to a spreadsheet package or a specialist statistical package.

Consolidation of skills should not consist entirely of mechanical exercises, but should include problem solving in a practical context where possible.

A typical project should take 8-12 hours to complete and should involve as many as possible of the topics noted in the content. Projects should be related to the work the students are likely to undertake in business or industry. Students may cooperate with other students when undertaking the project.

Students should maintain a workfile. This should form a complete record of the student's work throughout the module. The tutor should ascertain periodically that each student is maintaining the workfile adequately. The workfile could contain the student's notes, class handouts, completed worksheets, exercises, assignments, report(s) of investigation(s), report(s) or project(s), log book of computer activities and a summary of the important details of the module for later revision purposes.

Assessment
Procedures

Acceptable performance in the module will be satisfactory achievement of all the performance criteria specified for each Learning Outcome.

The following abbreviations are used below:

- LO Learning Outcome
- IA Instrument of Assessment
- PC Performance Criteria

L01 DISTINGUISH BETWEEN METHODS OF DATA COLLECTION

PC The student:

- (a) distinguishes between different types of data;
- (b) selects appropriate methods of data collection;
- (c) describes different sampling methods.

IA (1) Matching

Topics should be assessed on the number of occasions indicated:

- (a) examples of types of data:
 - qualitative data 3
 - discrete quantitative data 3
 - continuous quantitative data 3
- (b) methods of data collection to include:
 - 6 published statistics, direct observation, interview, questionnaire.

IA (2) Restricted Response Questions

- (c) sampling methods such as random, stratified, quota. 3

One question may cover more than one topic.

Satisfactory achievement of the Learning Outcomes will be demonstrated by the student producing at least 7 correct responses for (a), at least 4 correct responses for (b) and 3 correct descriptions for (c).

L02 CONSTRUCT AND USE STATISTICAL TABLES, GRAPHS AND CHARTS

PC The student:

- (a) present information in tabular form;
- (b) constructs graphs and charts;
- (c) extracts information from graphs and charts.

IA Graphical Exercise

Topics should be assessed on the number of occasions indicated:

- | | | |
|-----|---|---|
| (a) | tables from raw data:
simple frequency, grouped frequency,
relative frequency, cumulative frequency,
stem-leaf chart | 5 |
| (b) | graphs and charts from tables:
bar graph, line graph, pie chart, histogram
(equal class intervals) | 4 |
| (c) | information from graphs and charts:
bar graph, line graph, pie chart, histogram | 4 |

One question may cover more than one topic.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing at least 11 correct responses for (a), (b) and (c) together.

L03 CALCULATE SIMPLE STATISTICS

PC The student:

- (a) identifies mode or modal class from data;
- (b) determines median, quartiles and semi-interquartile range;
- (c) determines mean;
- (d) determines standard deviation.

IA Calculation Exercise

Topics should be assessed on the number of occasions indicated:

- | | | |
|-----|--|---|
| (a) | mode or modal class:
for raw data | 1 |
| | for a frequency distribution | 1 |
| (b) | median and quartiles:
for raw data | 1 |
| | for a frequency distribution graphically | 1 |
| (c) | mean:
for raw data | 1 |
| | for an ungrouped frequency distribution | 1 |
| | for a grouped frequency distribution | 1 |
| (d) | standard deviation:
for raw data | 1 |
| | for an ungrouped frequency distribution | 1 |
| | for a grouped frequency distribution | 1 |

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing at least 3 correct responses for (a) and (b) together and at least 5 correct responses for (c) and (d) together.

L04 COMPLETE A PROJECT WHICH REQUIRES THE APPLICATION OF STATISTICAL KNOWLEDGE AND SKILLS

PC The student:

- (a) plans the project;
- (b) gathers appropriate data;
- (c) analyses the data using the most appropriate statistical techniques;
- (d) presents conclusions using non-statistical language where possible.

IA Project

The project should have a clearly defined purpose expressed in non-statistical language. It should test the student's ability to select and use various statistical ideas and techniques developed in the module. The data may be collected by interview, direct observation, postal questionnaire or from published statistics, whichever is the most appropriate.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing a project report which shows evidence of the completion of all 4 processes in the performance criteria.

A support pack for this unit is available from SQA. Please

call our Sales and Despatch section on 0141-242 2168 to check availability and cost. Quote product code B093.