

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 7310071 **-Session-1991-92**
-Superclass- RH

-Title- **INTRODUCING ECOLOGICAL INVESTIGATIONS (x¹/₂)**

-DESCRIPTION-

Purpose This module enables the student to develop the skills required to measure environmental conditions and to use simple sampling techniques to investigate the distribution of plants and animals. The module will enable students to consider the effects of environmental factors on plant and animal communities.

The module is suitable for inclusion in an introductory programme in ecology or biology. It could be offered in conjunction with 7310061 Introducing Ecological Principles (x 1/2) and other Stage 1 Biology or Science modules. The module could also be used as a general interest topic in a variety of programmes.

Preferred Entry Level No formal entry requirements.

Outcomes The student should:

1. measure environmental conditions;
2. measure frequency and distribution of plants and animals;
3. relate the distribution of plants and animals to environmental factors.

Assessment Procedures Acceptable performance in this module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.

The following abbreviations are used below:

PC Performance Criteria
IA Instrument of Assessment

Note: The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

OUTCOME 1 MEASURE ENVIRONMENTAL CONDITIONS

- PCs
- (a) The preparation for the measurement is correct with respect to the apparatus selected.
 - (b) The procedures carried out are in accordance with given specifications and correct and safe with respect to the manipulation of instruments.
 - (c) The recorded results are to the appropriate accuracy and in an appropriate format.

IA Practical Exercises

3 practical exercises to assess the student's ability to measure given environmental conditions. Each exercise should involve the measurement of a different environmental condition.

Checklists should be devised to ensure a reliable interpretation of the student's practical performance and should contain all the Performance Criteria for the Outcome, including items specific to the instrument/apparatus used and the environmental condition being measured.

Satisfactory achievement of the Outcome will be demonstrated by the student achieving all the Performance Criteria for each of the THREE exercises.

OUTCOME 2 MEASURE FREQUENCY AND DISTRIBUTION OF PLANTS AND ANIMALS

- PCs
- (a) The preparation for the measurement is correct with respect to the apparatus selected.
 - (b) The procedures carried out are in accordance with given specifications and correct and safe with respect to the manipulation of instruments.
 - (c) The recorded results are to the appropriate accuracy and in an appropriate format.

IA Practical Exercises

2 practical exercises to assess the student's ability to measure frequency and distribution of plants and animals in given ecosystems.

Each exercise should involve the measurement of different organisms. At least ONE animal and ONE plant species should be included in each exercise.

Checklists should be devised to ensure a reliable interpretation of the student's practical performance and should contain all the Performance Criteria for the Outcome, including items specific to the methods/organisms involved.

Satisfactory achievement of the Outcome will be demonstrated by the student achieving all the Performance Criteria for both of the exercises.

OUTCOME 3 RELATE THE DISTRIBUTION OF PLANTS AND ANIMALS TO ENVIRONMENTAL FACTORS

PCs

- (a) The description of the distribution is correct with respect to:
- (i) randomness or nonrandomness;
 - (ii) variability.
- (b) The description of the effects of the environmental factor is correct with respect to:
- (i) cause;
 - (ii) effect.
- (c) The interpretation of data is correct with respect to:
- (i) identification of possible sources of error;
 - (ii) identification of factors effecting quantities measured.
- (d) The conclusions drawn are valid.

IA Extended Response

An extended response question to assess the student's ability to relate the distribution of plants and animals to environmental factors.

The student will be required to interpret data, draw appropriate conclusions and present evidence, not exceeding 200 words, regarding the probable effects of an environmental factor on a species.

Within the extended response 1 plant and 1 animal must be covered.

Satisfactory achievement of the Outcome will be demonstrated by the student achieving all the Performance Criteria.

**The following sections of the descriptor are offered as guidance.
They are not mandatory.**

CONTENT/CONTEXT

The environmental conditions to be measured should be selected according to locality and students' requirements.

Corresponding to Outcomes 1-3:

1. Environmental conditions to include: temperature, pH, light intensity, flow rate, wind speed.
 2. Measuring methods could include: pitfall traps, umbrellas, sweep nets, drag nets, plankton nets, quadrats, Tullgren funnel.
 3. Data can be provided for the student, or use the data collected in the field relating to Outcomes 1 and 2.
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SUGGESTED LEARNING AND TEACHING APPROACHES

During the work of the module students should have several opportunities to practise their skills. Each student should be assessed at appropriate points throughout the module. Where a student is unsuccessful in achieving an Outcome, provision should be made for remediation and reassessment.

A student-centred, practical approach is essential for this module. The Outcomes can be integrated so that concepts and skills can be developed throughout the module and this will be especially relevant if the data used for Outcome 3 is taken from the field exercises for Outcomes 1 and 2.

The module will complement 7310061 Introducing Ecological Principles (X^{1/2}) and can be run in conjunction with other Stage 1 Biology modules.

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