

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 0085005 -Session-1988-89
-Superclass- RC
-Title- INTRODUCTION TO BUILDING CRAFT SCIENCE (x¹/₂)

-DESCRIPTION-

Purpose This module is designed to provide a student following a programme of modules in building crafts with an appreciation of the relationship which exists between practical craft work and related scientific principles. It is intended that this module will develop an understanding of the material and construction technology involved in the many crafts within the construction industry. It would be particularly complementary to 85002 Construction Material and Products.

Preferred Entry Level No formal entry requirements.

Learning Outcomes The student should:

1. carry out simple laboratory experiments;
2. demonstrate laboratory reporting procedures;
3. know the practical applications of scientific principles.

Content/ Context Safe working practices and procedures should be observed at all times.

Please note that the following Content is not considered to be a conclusive list but is intended to provide a guide to scientific principles frequently encountered in the construction industry.

Corresponding to Learning Outcomes 1-3:

1. Range of laboratory experiments: Water Absorption - compare the rate of various building materials; Moisture Content - measurement using oven method/protimeter; Permeability of various building materials; Capillarity - study the behaviour of water in narrow spaces; Adhesion/Cohesion - study the tendency of water to stick to other surfaces; Surface Tension - study the behaviour of the surface of water; Density - study the behaviour of various building materials - mass/volume or displacement; Porosity - study the behaviour of various building materials - $\frac{\text{vol of voids}}{\text{bulk vol}} \times 100\%$; Moisture on metals - study the effect on a variety of ferrous and non-ferrous metals; Condensation - study the effects on various surfaces.
2. Laboratory reporting procedure: Title of experiment; Apparatus (list, sketch or diagram); Method (describing in detail each stage of the experiment); Results (including calculations, tables and/or graphs); Conclusions (emphasising the significance of the results).
3. Practical applications: efflorescence, rising damp, deterioration of surface finishes, use of surface coatings, strength of material, choice of roof coverings, use of cavity walls, wall ties, anti-capillary grooves, throatings, sound insulation, electrolytic action, rusting, metal oxides.

Suggested Learning and Teaching Approaches

Although it may be considered desirable to have direct access to a laboratory it should be recognised that many of the experiments/apparatus required for this module can be used in a classroom/workshop situation. Scientific principles relating to laboratory experiments should not be taught as isolated units but with an emphasis on any theme that may link many of the scientific principles studied. There is scope within this module to introduce the student to a wide range of scientific principles using laboratory experiments. It would be expected that as wide a range of experiments as possible would be covered related to the students craft discipline.

Measurement, recording and calculating should be of reasonable accuracy to allow for the student to provide a practical conclusion.

Examples of the effects of the principles observed in this module and any design/construction details so related should be made available for inspection by the students via small practical models, real life situations, AV material. Working in pairs may be advantageous as this should encourage teamwork and a spirit of collaboration considered essential ingredients of any investigative approach. It should be emphasised throughout the teaching of this module that the reason for the students carrying out experiments is so they can isolate and study scientific principles that influence the design/construction details that they will encounter first hand within their own and other craft disciplines. Students should be encouraged to use sketches as a means of relating scientific principles to practical situations.

Assessment Procedures

Acceptable performance in the module will be satisfactory achievement of the performance criteria specified for each Learning Outcome. The following abbreviation will be used below:

LO Learning Outcomes
 IA Instrument of Assessment
 PC Performance Criteria

LO1 CARRY OUT SIMPLE LABORATORY EXPERIMENTS.

PC The student:

- (a) selects laboratory apparatus;
- (b) uses apparatus in the manner stipulated;
- (c) works to a safe and systematic procedure throughout.

IA Assignment

The student will be set an assignment to test the application of knowledge and skills required to carry out simple laboratory experiments.

The assignment will consist of 4 laboratory experiment sheets detailing the object of experiment, apparatus, method, details of measurable results required from the experiment.

All the apparatus used should be of a simple straightforward nature.

The experiments will be allocated as follows:

- (a) 2 experiments on the scientific principles associated with the effects or movement of moisture;
- (b) 1 experiment on the principle of density;
- (c) 1 experiment to be optional relative to the interest of the student group.

Satisfactory achievement of the Learning Outcome will be based on the student carrying out 4 experiments in the manner described in the Laboratory Experiment Sheets.

LO2 DEMONSTRATE LABORATORY REPORTING PROCEDURES

PC The student for each experiment:

- (a) measures data;
- (b) records data;
- (c) calculates/states results obtained;
- (d) completes conclusions describing the scientific principle covered by the experiment.

IA Assignment - Laboratory Report

The student will complete 4 laboratory reports detailing: object; apparatus; methods; results, and conclusion for each of the experiments carried out.

- (a) 2 experiments associated with the effects or movement of water;
- (b) 1 experiment on the principle of density;
- (c) related to the discipline of the student group.

Satisfactory achievement of the Learning Outcome will be based on the student completing 4 legible laboratory reports which contain accurate results and a practical conclusion in relation to the results.

LO3 KNOW THE PRACTICAL APPLICATION OF SCIENTIFIC PRINCIPLES

PC The student:

- (a) identifies the scientific principle associated with a practical application;
- (b) identifies practical applications associated with a scientific principle.

IA Matching Items

The student will be presented with matching items which will test the ability to apply scientific principles tested in laboratory conditions to practical situations. The test will consist of 2 lists as follows:

- | | |
|----------------------------------|----|
| (a) scientific principles | 6 |
| (b) related practical situations | 12 |

Satisfactory achievement of the Learning Outcome will be demonstrated by the student matching 2 situations to each principle.

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