-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- **0091048** **-Session-1989-90**

-Superclass- **RB**

-Title- **MATHEMATICS: CONSTRUCTION NUMERACY 1 ($x^1/_2$)**

-DESCRIPTION-

Purpose

This module is designed to enable the student who is interested in, or employed within, the construction industry. It provides the student with a series of basic mathematical/ numerical tools sufficient to operate effectively at craft level in construction.

Preferred Entry Level

No formal entry requirements.

Learning Outcomes

The student should:

1. carry out basic calculations;
2. calculate perimeters, areas and volumes of rectilinear shapes;
3. apply simple costing methods.

Content/ Context

<u>Corresponding to Learning Outcomes 1-3:</u>

1. Add, subtract, multiply and divide integers. Add, subtract, multiply and divide decimal fractions. Use a calculator. Calculate vulgar fractions: fractions of a quantity eg ½, ⅔, ¾, conversion to decimals eg ½ ⅔, ¾, ⅝. Calculations should be expressed in a context relevant to the craft area.
2. Calculate perimeters and areas of rectilinear shapes including composite shapes. Calculate volume and capacity of rectilinear shapes. Identify the relationship between capacity and surface coverage. Use appropriate units: mm, m, mm^2, m^2, mm^3, m^3 and litres. Calculations should be expressed in a context relevant to the craft area.

3 The assignment should involve the application of the content of the other Learning Outcomes. It should be expressed in a context relevant to the craft area eg. itemising and costing a roof or brickwork for a small extension or garage; tiling, roughcasting or plastering an outbuilding. Relevant information may be obtained from commercial tables, charts, catalogues, etc.

Suggested Learning and Teaching Approaches

The module could be integrated with relevant craft modules.

Consolidation of skills should not consist entirely of mechanical exercises but should include problem solving in a practical context where possible. Group investigations may be appropriate, however, calculations should be carried out individually.

When using calculators students should be encouraged to use estimation techniques for relevant calculations. Computers may be used where appropriate.

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), 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 CARRY OUT BASIC CALCULATIONS

PC The student:

(a) adds, subtracts, multiplies and divides using integers;
(b) adds, subtracts, multiplies and divides using decimal fractions;
(c) calculates common vulgar fractions.

IA Calculation Exercise

Topics should be assessed on the number of occasions indicated:

(a)	integers:	
	on paper - addition, subtraction, multiplication, short division	4
	by calculator - addition, subtraction, multiplication, division	4
(b)	decimal fractions:	
	on paper - addition, subtraction, multiplication, division (by single digit whole numbers)	4
	by calculator - addition, subtraction, multiplication, division	4
(c)	vulgar fractions:	
	conversions eg ¾ as a decimal	2
	fractions of a quantity eg. ¾ of 500	2

One question may cover more than one topic

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing with at least 6 correct responses, with at least one correct response for each arithmetic operation, for both (a) and (b) and at least 3 correct responses for (c).

L02 CALCULATE PERIMETERS, AREAS AND VOLUMES OF RECTILINEAR SHAPES

PC The student:

(a) calculates perimeters using appropriate units;
(b) calculates areas using appropriate units;
(c) calculates volumes using appropriate units.

IA Calculation Exercise

Topic should be assessed on the number of occasions indicated:

(a)	perimeters of shapes	2
(b)	areas of shapes	2
(c)	volumes of shapes	2

One question may cover more than one topic.

For both (a) and (b) at least one shape should be composite

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing at least 5 correct responses in total.

L03 APPLY SIMPLE COSTING METHODS

PC The student:

(a) obtains relevant information;
(b) carries out appropriate calculations to obtain satisfactory results;
(c) communicates the results.

IA Assignment

The assignment will involve a simple costing exercise which integrates mathematical skills developed in the module. It should be expressed in a practical context relevant to the craft area.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student meeting all the performance criteria.