

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 0085137 -Session-1988-89

-Superclass- TE

-Title- BUILDING TECHNOLOGY : INTRODUCTION (x 2)

-DESCRIPTION-

Purpose This module enables technicians within the construction industry to acquire an understanding of the basic principles involved in the construction of two storey domestic dwellings.

Preferred Entry Level Standard Grade in English

Learning Outcomes The student should:

1. know the preparatory site work required to enable building work to proceed;
2. know the processes and details associated with substructure construction;
3. know the construction of superstructure brickwork and blockwork;
4. know the functions and constructional details of floors;
5. know the design requirements and constructional details of timber stairs;
6. know the functional requirements and constructional details of timber roofs and their associated coverings;

7. know the materials and applications of insitu wall finishes.

Content/
Context

Corresponding to Learning Outcomes 1-7:

Reference should be made to the sections of the current Building Standards (Scotland) Regulations.

1. Need for planning of site layout; access and temporary roads; storage of materials; temporary services.
2. Substructure is defined as the structure up to damp proof course (DPC) level.

Removal of topsoil : purposes of foundations; strips foundations, deep strip, stepped foundations; excavation of trenches, timbering, safety precautions; solum treatment, upfill; brickwork to ground floor; DPC mortar mixes, bonds, scarcement, cavity fill wall ties, ventilation service entry; pipework and pick ups; concrete mixing and placings.

3. Functions : strength and stability, weather resistance, thermal insulation, sound insulation; details at window and door openings.

Bonds and damp proof courses.

Fireplaces : hearth, fender walls, infill, surface treatment, fireplace construction; flues, flue linings, stacks, terminals.

Regulations relevant to brick and block construction.

4. Ground floors: insitu and precast concrete; damp proofing, timber ventilation, access, joist sizing, preservatives, types of flooring.

Upper floors: precast concrete; timber-joist sizing, layout, support, strutting, trimming at openings; provision of services, sound insulation, flooring.

5. Timber stairs: principles of design including safety and comfort considerations; straight flights; half landings; quarter landings; winders, terminology; regulations governing stair design.

6. Functions of roofs: common roof constructions, trusses, rafters, hips, valleys, gable, trussed rafters, thermal insulation.

Slating and tiling.

Timber flat roofs: bituminous felt coverings.

7. External rendering: dry and wet finishes.

Plasterwork to walls and ceilings. Treatment of corners, stop beads.

Suggested Learning and Teaching Approaches

After initial introduction by the lecturer to each Learning Outcome, the student should be guided to relevant sources of reference.

Discussion and debate with fellow students and course tutor should be encouraged. Individual or group projects could be set with pre-prepared worksheets used to save time. Much knowledge could be gained by:

- (a) appropriate site visits;
- (b) visit to college craft workshops/project areas;
- (c) inspection of home and/or college buildings;
- (d) slides, audio-visuals, scale models.

Construction safety should be integrated in every Learning Outcome.

Students should be encouraged to develop their communication skills by means of sketches.

Assessment Procedures Criteria

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

The following abbreviations are used below.

LO Learning Outcome
IA Instrument of Assessment
PC Performance Criteria

LO1 KNOW THE PREPARATORY SITE WORK REQUIRED TO ENABLE BUILDING WORK TO PROCEED

PC The student:

- (a) describes how common building materials are safely and securely stored on site;
- (b) describes how common building materials are transported within a site;
- (c) describes how members of the public are protected during the execution of building work;

- (d) lists the temporary services which are required on site.

IA Assignment

The student is provided with an outline plan of a small housing development of traditional construction, which is adjacent to a major road.

The student is required to indicate the following:

- (a) how cement, bricks, aggregates, timber, roof trusses, plasterboard, windows, ironmongery and paint are stored on site to protect them from the weather, accidental damage and theft;
- (b) how materials (as in (a) above) are transported around the site;
- (c) how hoardings, walkways, barriers, lights, etc, are used to protect members of the public from accidental injury;
- (d) the temporary services including electricity, water, telephones, drainage, which are required to enable the contractor to construct the buildings.

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

LO2 KNOW THE PROCESSES AND DETAILS ASSOCIATED WITH SUBSTRUCTURE CONSTRUCTION

PC The student:

- (a) describes how strip foundations transmit building loads to the soil;
- (b) explains the need for deep strip foundations and outlines their construction;
- (c) identifies the plant used in excavation and removal of spoil;
- (d) identifies the precautions taken to excavate trenches safely;
- (e) describes how concrete is mixed and placed on site;
- (f) identifies the correct positions and dimensions of the elements which make up the substructure.

IA (1) Restricted Response Questions

The student will be presented with questions which test the knowledge of the constructional process and constructional details of the substructure.

The exercise will consist of 12 questions allocated as follows:

- | | | |
|-----|-----------------------------|---|
| (a) | trench foundations | 4 |
| (b) | safe excavation of trenches | 4 |
| (c) | concrete mixing and placing | 4 |

Satisfactory achievement IA(1) will be demonstrated by the student producing 3 correct responses to each of (a), (b) and (c).

IA (2) Assignment

The student is required to produce an instrument-aided annotated sketch of a section through the substructure of a building. The foundation shall be approximately 1 metre deep, the floor shall be suspended timber and at a level 300mm above the outside ground level.

Satisfactory achievement IA(2) will be demonstrated by the student showing on the sketch the correct positions and dimensions of concrete foundations, cavity wall, cavity fill, hardcore upfill, solum treatment, wallplate, DPC, ventilator, outside ground, wall ties.

LO3 KNOW THE CONSTRUCTION OF SUPERSTRUCTURE BRICKWORK AND BLOCKWORK

PC The student:

- (a) outlines the functional requirements of walls;
- (b) identifies the requirements of the Building Standards (Scotland) Regulations regarding fireplaces and flues;
- (c) describes the common brick bonds;
- (d) identifies the types of damp proof courses;
- (e) selects appropriate mortar mixes for different circumstances;
- (f) identifies the correct positions and dimensions of the elements of an external wall.

IA (1) Restricted Response Questions

The student will be presented with questions which test the knowledge of the construction of superstructure brickwork and blockwork, including fireplace construction.

The exercise will consist of 18 questions allocated as follows:

(a)	functional requirements of walls	5
(b)	fireplace construction	5
(c)	types of bond	3
(d)	type of DPC	3
(e)	mortar mixes	2

Satisfactory achievement IA (1) will be demonstrated by the student producing 4 correct responses to each of (a) and (b) and 2 correct responses to each of (c) and (d) and 1 correct response to (e).

IA (2) Assignment

The student is required to produce an instrument aided annotated sketch of a section through a window opening in a cavity wall. The window itself should only be in outline.

Satisfactory achievement of IA(2) will be demonstrated by the student showing the correct position and dimensions of the lintel, precast concrete sill, DPC, rendering, insulation and brick or block wall.

LO4 KNOW THE FUNCTIONS AND CONSTRUCTIONAL DETAILS OF FLOORS

PC The student:

- identifies the correct positions and dimensions of the elements of insitu concrete floors;
- describes the steps taken to prevent dampness and decay in timber ground floors;
- selects the correct size of joist for a given span and spacing;
- outlines the flooring materials which are commonly used;
- describes the use of precast concrete floor units.

IA (1) Structured Question

The student will be presented with an incomplete drawing indicating a strip foundation and a brick cavity wall from the foundation to approximately 300mm above DPC level, cavity fill, outside ground level and the position of the DPC in the wall.

Satisfactory achievement of IA(1) will be demonstrated by the student showing the correct position and dimensions of an insitu concrete floor slab complete with, damp proof membrane, insulation, upfill, blinding and steel reinforcement.

IA (2) Restricted Response Questions

The student will be presented with questions which test the knowledge of suspended floors.

The exercise will consist of 12 questions allocated as follows:

- | | | |
|-----|-------------------------|---|
| (a) | timber ground floors | 4 |
| (b) | timber upper floors | 4 |
| (c) | precast concrete floors | 4 |

Satisfactory achievement of IA(2) will be demonstrated by the student producing 3 correct responses to each of (a), (b), and (c).

LO5 KNOW THE DESIGN REQUIREMENTS AND CONSTRUCTIONAL DETAILS OF TIMBER STAIRS

PC The student:

- names the component parts of a stair;
- identifies types of stairs;
- shows the correct positions and dimensions of the elements of a timber stair;
- identifies the regulations and design requirements governing stairs.

IA (1) Restricted Response Questions

The student will be presented with questions which test the knowledge of stair design and the regulations governing stairs.

The exercise will consist of 15 questions allocated as follows:

- | | | |
|-----|---------------------|---|
| (a) | terminology | 5 |
| (b) | design requirements | 5 |
| (c) | regulations | 5 |

Satisfactory achievement IA(1) will be demonstrated by the student producing 4 correct responses to each of (a), (b) and (c).

IA (2) Assignment

The student is required to produce a vertical section through a timber staircase at the top or bottom of an open flight of stairs.

Satisfactory achievement of IA(2) will be demonstrated by the student showing the correct positions and dimensions of treads, risers, newal post, handrail and landing/floor.

LO6 KNOW THE FUNCTIONAL REQUIREMENTS AND CONSTRUCTIONAL DETAILS OF TIMBER ROOFS AND THEIR ASSOCIATED COVERINGS

PC The student:

- (a) describes various types of roof constructions;
- (b) names the parts of sloping and flat roofs and outlines their function;
- (c) describes the common forms of roof insulation and describes how they are incorporated into roofs;
- (d) describes how slates and tiles are used to cover roofs;
- (e) describes how bituminous felt is used to cover flat roofs.

IA Restricted Response Questions

The student will be presented with questions which test the knowledge of the construction of timber roofs and their associated coverings.

The exercise will consist of 16 questions allocated as follows:

- | | |
|--------------------------------|---|
| (a) types of roof construction | 4 |
| (b) component parts of roofs | 4 |
| (c) thermal insulation | 4 |
| (d) roof coverings | 4 |

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing 3 correct responses to each of (a), (b), (c) and (d).

LO7 KNOW THE MATERIALS AND APPLICATIONS OF INSITU WALL FINISHES**PC** The student:

- (a) outlines typical mixes;
- (b) describes how external rendering is applied to walls, including preparation and protection;
- (c) describes how plaster is applied to walls and ceilings, including preparation and protection.

IA Restricted Response Questions

The student will be presented with questions which test the knowledge of external rendering and internal plasterwork to walls and ceilings.

The exercise will consist of 20 questions allocated as follows:

- | | |
|--|----|
| (a) external renderings | 10 |
| (b) internal plasterwork to walls and ceilings | 10 |

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing 8 correct responses to each of (a) and (b).

02/12/98

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