

National Unit Specification: general information

UNIT Product Design: Manufacturing Products (Intermediate 2)

CODE DF4X 11

COURSE Product Design (Intermediate 2)

SUMMARY

In this Unit candidates will gain knowledge and understanding of commercial manufacturing processes and materials and why they are used for particular products. Candidates will also complete an orthographic drawing to convey information required for the manufacture of products. The Unit is suitable for candidates with previous experience in related subjects (such as Craft and Design and Graphic Communication). It is also suitable as an introduction for candidates studying product design for the first time.

OUTCOMES

1. Explain why particular materials are used for the manufacture of commercial products.
2. Explain why particular processes are used for the manufacture of commercial products.
3. Complete an orthographic drawing suitable for use in the manufacture of a given product.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have achieved one of the following or equivalent:

- ◆ Standard Grade Craft and Design at General level
- ◆ Standard Grade Graphic Communication at General level

Administrative Information

Superclass: VF

Publication date: April 2004

Source: Scottish Qualifications Authority

Version: 01

© Scottish Qualifications Authority

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this Unit Specification can be purchased from the Scottish Qualifications Authority. The cost for each Unit Specification is £2.50. (A handling charge of £1.95 will apply to all orders for priced items.)

National Unit Specification: general information (cont)

UNIT Product Design: Manufacturing Products (Intermediate 2)

CREDIT VALUE

1 credit at Intermediate 2 (6 SCQF credit points at SCQF level 5*).

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

CORE SKILLS

There is no automatic certification of Core Skills or Core Skills components in this Unit.

National Unit Specification: statement of standards

UNIT Product Design: Manufacturing Products (Intermediate 2)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

OUTCOME 1

Explain why particular materials are used for the manufacture of commercial products.

Performance Criteria

- (a) Materials used to manufacture given products are correctly identified.
- (b) Reasons are given to justify the identification of materials.
- (c) An explanation is given for why materials are suitable for the given products.

Evidence Requirements

(See Evidence Requirements for the Unit at the end of the statement of standards.)

OUTCOME 2

Explain why particular processes are used for the manufacture of commercial products.

Performance Criteria

- (a) Processes used to manufacture given products are correctly identified.
- (b) Reasons are given to justify the identification of processes.
- (c) An explanation is given for why processes are suitable for the given products.

Evidence Requirements

(See Evidence Requirements for the Unit at the end of the statement of standards.)

OUTCOME 3

Complete an orthographic drawing suitable for use in the manufacture of a given product.

Performance Criteria

- (a) An orthographic drawing with one view given is completed accurately.
- (b) Line type and dimensioning are correct.

Evidence Requirements

(See Evidence Requirements for the Unit at the end of the statement of standards.)

National Unit Specification: statement of standards (cont)

UNIT Product Design: Manufacturing Products (Intermediate 2)

EVIDENCE REQUIREMENTS FOR THE UNIT

Evidence for this Unit can be written or oral, and graphical. The evidence should be produced under supervised closed-book conditions. The assessment must be capable of being completed in one hour 30 minutes, and will cover all Outcomes.

For Outcomes 1 and 2, evidence is required in the form of responses to questions which test the knowledge and understanding outlined in the PCs.

For Outcome 3, the candidate will be required to complete an orthographic drawing where one view is given.

Achievement is to be decided by the use of a cut-off score. The standard to be applied is detailed in the National Assessment Bank items available for this Unit. If a centre wishes to design its own assessments for this Unit, they should be of a comparable standard.

National Unit Specification: support notes

UNIT Product Design: Manufacturing Products (Intermediate 2)

This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This Unit focuses on the planning for manufacture of commercial products and the materials and processes used for manufacture. Candidates will consider why particular materials and processes are chosen for commercial products.

The Course content which is likely to be covered in this Unit is detailed below:

Plastics:	Polythene (high and low density), polyvinyl chloride, polystyrene, nylon, cellulose acetate, acrylic, polypropylene, ABS, epoxy resin, melamine formaldehyde, urea formaldehyde, polyester resin, glass-reinforced plastic, carbon-fibre plastics, elastomers.
Metals:	Stainless steel, high-speed steel, high carbon steel, brass, bronze, duralumin, aluminium, copper, tin, lead, zinc, cast iron, mild steel.
Woods:	Beech, oak, ash, mahogany, teak, walnut, balsa, Scots pine, red cedar, parana pine, spruce.
Timber derivatives:	Manufactured boards (medium density fibreboard, plywood, blockboard, chipboard, hardboard), veneer.
Identification of materials:	Colour, surface texture, weight, properties, labelling and symbols.
Plastic processes:	Injection-moulding, extrusion, rotational moulding, vacuum-forming, blow-moulding, laminating, joining, compression moulding, finishing.
Metal process:	Turning, milling, die-casting, pressing, stamping, punching, joining (spot welding, arc welding, riveting, adhesives, fitted joints, bolts, screws, patent devices), sand casting, casting, piercing and blanking, forging, finishing.
Wood processes:	Turning, routing, spindle moulding, laminating, jointing, finishing.
Identification of processes:	Form, material, split lines, injection points, ejector points, shrinkage, draft angle, intricate form, clean and precise, flash, thinning of sheet material at corners, shear marks, cross-section over length, surface texture.
Orthographic drawing:	Elevation, end elevation, plan, outline, hidden detail, centre-line, dimensioning – all to BS conventions.

National Unit Specification: support notes (cont)

UNIT Product Design: Manufacturing Products (Intermediate 2)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Candidates should be introduced to materials and processes through the examination of actual products. Candidates should have access to commercially manufactured products throughout the Unit.

Candidates should be given sufficient opportunity to develop orthographic drawing skills to prepare them for Outcome 3 assessments.

Centres may wish to ask candidates to consider the commercial manufacture of the product which has been designed in Unit 2 as a method of covering the learning and teaching for all three Outcomes.

The Course Arrangements give further information on teaching and learning in a Course context. It should be noted that there are areas of content in the Course which are not directly assessed within the Unit but are covered in the external Course assessment.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

There are two types of evidence required in this Unit. Outcomes 1 and 2 require responses to questions on materials and processes. Outcome 3 requires the completion of an orthographic drawing. Centres may wish to teach and assess materials and processes separately from orthographic drawing.

The standard to be applied is detailed in the National Assessment Bank items available for this Unit.

SPECIAL NEEDS

This Unit Specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering special alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, September, 2003).