



National Unit Specification: general information

UNIT Computer Aided Drawing for Construction (SCQF level 6)

CODE F3J8 12

SUMMARY

This Unit is suitable for candidates who have limited or no experience of Civil Engineering and the Built Environment, or of Computer Aided Drawing for Construction.

This Unit aims to introduce the candidate to the use of Computer Aided Drawing software to produce 2D construction drawings. The Unit is intended to develop candidate ability and confidence in the production and editing of simple construction drawings, and to develop their graphical presentation skills to be able to communicate effectively with other members of the construction team.

OUTCOMES

- 1 Use a range of computer aided drawing commands.
- 2 Produce a 2D computer aided drawing.

RECOMMENDED ENTRY

Whilst entry is at the discretion of the centre, it would be beneficial for the candidate to have skills in basic IT and drawing conventions.

CREDIT VALUE

1 credit at Higher (6 SCQF credit points at SCQF level 6*).

**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.*

Administrative Information

Superclass: VF

Publication date: April 2008

Source: Scottish Qualifications Authority

Version: 01

© Scottish Qualifications Authority 2008

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. Please contact the Customer Contact Centre, telephone 0845 279 1000.

National Unit Specification: general information (cont)

UNIT Computer Aided Drawing for Construction (SCQF level 6)

CORE SKILLS

There is no automatic certification of Core Skills or Core Skill components in this Unit. Opportunities for developing aspects of Core Skills are highlighted in *Guidance on Learning and Teaching Approaches*.

National Unit Specification: statement of standards

UNIT Computer Aided Drawing for Construction (SCQF level 6)

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 SQA.

OUTCOME 1

Use a range of Computer Aided Drawing commands.

Performance Criteria

- (a) Computer aided drawing model drawing environment is set up correctly.
- (b) Computer aided drawing commands are used correctly to draw a 2 dimensional model of a construction feature.
- (c) Dimensions and leaders to annotate the model are used correctly.
- (d) Dimension styles are edited correctly.

OUTCOME 2

Produce a 2D Computer Aided Drawing.

Performance Criteria

- (a) Paper view environment for computer aided drawing and section are set up correctly for a given paper size.
- (b) Insert a border and title box, including text correctly in paper space.
- (c) Text styles are selected appropriately and edited correctly.
- (d) Drawing and Section are inserted accurately to scale in paper space.
- (e) Layout, presentation and scale are appropriate to the type of drawing and section.

EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that the candidates have achieved all Outcomes and Performance Criteria.

Product evidence is required to demonstrate that the candidate has achieved this Unit to the standard specified in the Outcomes and Performance Criteria. The evidence for this Unit should be obtained under controlled, supervised conditions. The assessment will be open-book and should last no more than 4 hours.

Candidates are required to produce two finished, dimensioned, 2D, scale computer aided drawing and section of a construction feature, incorporating straight lines, circles, rectangles and arcs, at least two different line types, hatching, dimensions and annotations as well as a brief report detailing use made of draw, modify, dimension and zoom commands.

National Unit Specification: statement of standards (cont)

UNIT Computer Aided Drawing for Construction (SCQF level 6)

CAD commands:

Draw — line, circle, rectangle, arc, hatch, text

Modify — copy, mirror, offset, fillet, trim, extend

Dimension — linear dimension, baseline dimension, continued dimension, angular dimension, radius, annotation with leader

Dimension styles

Line types

Zoom — zoom window, zoom extents, zoom scale, zoom dynamic

Drawing types:

Orthographic — plan, elevation, cross Section, detail, reinforcement, steel erection

Evidence should be produced in controlled open-book conditions at appropriate points throughout the Unit. The total time given in the assessment of all Outcomes should not exceed four hours.

An appropriate instrument of assessment would be product evidence where candidate produce CAD drawings using commands Candidates may use notes, textbooks and handouts.

The Assessment Support Pack for this Unit provides appropriate sample assessment materials. Where centres wish to develop their own assessment materials they should refer to the Assessment Support Pack to ensure a comparable standard.

National Unit Specification: support notes

UNIT Computer Aided Drawing for Construction (SCQF level 6)

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 has been developed as a mandatory Unit in the National Certificate in Built Environment and Civil Engineering at SCQF level 6 and can also be delivered as a free standing Unit.

Outcome 1

This Outcome should introduce candidates to the Computer Aided Drawing model-drawing environment, and a wide range of commands used to prepare Computer Aided Drawings efficiently. Assessors should begin with setting up the model drawing environment, and proceed from simple shapes to more complex shapes made with efficient use of the modify commands. Dimensioning should start from simple linear dimensions, progressing to baseline dimensions, continued dimensions, angles, radii of curves, and annotations with leaders. This should then continue with use of and alteration of dimension styles, and line types.

CAD commands should include line, circle, rectangle, arc, hatch, copy, mirror, offset, fillet, trim and extend

For this Outcome, a suitable construction feature such as a road layout with roundabout, or a car park layout should be drawn.

Consideration of presentation techniques for the final drawing should be encouraged.

Outcome 2

This Outcome should provide candidates with the knowledge and skills required to present drawings effectively and accurately. Use of paper space, laying out drawings, appropriate use of scale, correct use of title blocks and borders should all be covered, and the finished drawing should be to the appropriate British Standard and any other current guidance on CAD drawing, and include sufficient information for a contractor to construct the feature.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

It is recommended that the Outcomes be completed in the sequence presented.

This Unit should be viewed as a practical Unit, and the majority of candidates' time spent practicing and developing CAD skills, and examining existing drawings. A wide range of drawings should be available, including general arrangement drawings, detail drawings, site plans, etc for a range of construction methods, including masonry, steel and reinforced concrete. AutoCAD LT, AutoCAD, or any similar software, may be used.

National Unit Specification: support notes (cont)

UNIT Computer Aided Drawing for Construction (SCQF level 6)

If candidates have not already completed the Unit 'Drawing for Construction', then a brief explanation of the purpose of different drawings and methods of presentation should be included as an introduction.

Underpinning knowledge of the requirements for construction drawings can be provided through examination and interpretation of a range of construction drawings, covering a range of project types and of drawing purposes.

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In this Unit candidates will be:

- ◆ interpreting information from a given design
- ◆ reading and drawing designs
- ◆ using CAD programmes to produce drawings

These offer opportunities to develop aspects of the Core Skills of:

- ◆ *Information Technology*
- ◆ *Problem Solving*

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by information and communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

For Outcome 1 candidates could be presented with an architect/engineers sketch indicating the location, layout and requirements of a suitable feature from which they will prepare a dimensioned and annotated Computer Aided Drawing and Section in model space. For Outcome 2 candidates could prepare a drawing template for a given standard size of paper, including border and title block. The drawings from Outcome 1 could then be inserted to scale in a suitable position to produce two finished drawings. Suitable features should be from the Construction Industry, eg road/car park layouts, manholes, steel sections, pipes and fittings, arches, kitchen/bathroom fittings, landscaping, waste water treatment works, etc. The drawings should be of a similar to those in the exemplar assessment.

In order to assess the use of modify and zoom commands, and editing of text and dimension styles, a brief report should be included which could explain how these features were used in the preparation of the Computer Aided Drawing.

National Unit Specification: support notes (cont)

UNIT Computer Aided Drawing for Construction (SCQF level 6)

Candidates should produce two clear, well presented CAD drawings, fully annotated, with suitable borders and title boxes, using the range of commands required.

CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* (www.sqa.org.uk).