



National Unit specification

General information

Unit title: Computer Aided Drafting: An Introduction (SCQF level 6)

Unit code: H65V 46

Superclass: VF

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Version: 01

Unit purpose

This Unit aims to introduce the learner to the use of Computer Aided Drafting software to produce 2D construction drawings. The Unit is intended to develop the learner's ability and confidence in the production and editing of simple construction drawings. It will also develop their graphical presentation skills ensuring they are able to communicate effectively with other members of the construction team.

This Unit is suitable for learners who have limited or no experience of Computer Aided Drafting for Construction, particularly within the fields of Civil Engineering or the Built Environment.

Outcomes

On successful completion of the Unit the learner will be able to:

- 1 Use a range of computer aided drafting commands.
- 2 Produce 2D computer generated drawings.

Recommended entry

Entry is at the discretion of each learning centre. However learners would benefit from having some basic IT skills and drawing experience.

National Unit specification: General information (cont)

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Credit points and level

1 National Unit credit at SCQF level 6: (6 SCQF credit points at SCQF level 6)

Core Skills

Achievement of this Unit gives automatic certification of the following Core Skills component:

Complete Core Skill	None
Core Skill component	Critical Thinking at SCQF level 4 Providing/Creating Information at SCQF level 6

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of this Unit specification.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

The Assessment Support Pack (ASP) for this Unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable instrument of assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (<http://www.sqa.org.uk/sqa/46233.2769.html>).

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

National Unit specification: statement of standards

Unit title: Computer Aided Drafting: An Introduction (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 drafting commands.

Performance Criteria

- (a) Set up drawing environment to given information.
- (b) Use drawing tools and commands to create a suitable drawing template.
- (c) Create a new layout and insert new drawing template.
- (d) Set up text heights and styles to suit template.

Outcome 2

Produce 2D computer generated drawings.

Performance Criteria

- (a) Use tools and commands to create 2D drawings.
- (b) Set up dimension and leader styles.
- (c) Produce and print drawings to an appropriate scale.

Evidence Requirements for this Unit

Evidence is required to demonstrate that the learner has achieved all Outcomes and Performance Criteria.

Production of evidence is required by the learner to demonstrate competence by meeting the standards specified in the Outcomes and Performance Criteria. Evidence should be obtained under controlled, supervised conditions. Assessment will be continuous throughout the duration of this Unit whilst adopting an open-book approach.

Learners are required to produce two complete, fully annotated 2D, scaled, computer generated drawings of construction details specific to each Learner's area of study. This should include the use of straight lines, circles, rectangles and arcs, at least two line types, hatching, dimensioning where appropriate and full annotation.

An appropriate instrument of assessment will be evidenced by the Learner producing CAD drawings using applicable commands. Learners may use notes, textbooks, handouts and software help pages.

The assessor must ensure that evidence is authenticated as the learners own work under these assessment requirements particularly in the use of digitised materials and drawing files.



National Unit Support Notes

Unit title: Computer Aided Drafting: An Introduction (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 within the National Certificate Built Environment and the National Certificate Civil Engineering at SCQF level 6. This Unit can be delivered as a stand-alone Unit.

Outcome 1

This Outcome will introduce learners to the Computer Aided Drafting environment. The Unit covers a wide range of commands applied through the software interface to prepare and publish computer generated drawings efficiently.

Assessors should begin by setting up the drawing environment that will suit the learner's requirements with regards to: Drawing window colours, view cube on/off, grid on/off, menu bar on/off, ribbon setup, etc.

Assessors can then move onto setting up the model drawing environment. Using basic drawing commands: line, rectangle, explode, offset, trim/extend, learners can be guided towards creating a simple layout sheet to include margins, title panel, etc. This can be saved as a .dwg or .dwt file for use when publishing the final draft for assessment purposes.

Outcome 2

This Outcome should provide learners with the knowledge, understanding and skills required to present drawings effectively and accurately. Use of paper space/model space, laying out drawings, appropriate use of scale, correct use of title blocks and borders should all be covered. The finished drawing should comply with current British and European Standards. Learners should include sufficient information to allow a contractor to construct the feature.

This Unit is an integral part of the National Certificate in the Built Environment and National Certificate in Civil Engineering qualifications. It will provide learners with basic CAD skills that will enhance their underpinning knowledge and understanding necessary to progress onto a number of HN and SVQ programmes to which Computer Aided Drafting is a feature. Learners will enhance their employment prospects by gaining skills prospective employers can relate to within a modern construction/civil engineering industry.

National Unit Support Notes (cont)

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Guidance on approaches to delivery of this Unit

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

This Unit should be viewed as a practical Unit. The majority of learner's time should be spent practicing and developing CAD skills, and examining existing drawings. A wide range of drawings should be available to learners, including site plans, general arrangement drawings and detail drawings. AutoCAD or similar software may be used.

For learners to successfully complete this Unit they must show competence in the use of the following commands:

Draw — line, circle, rectangle, arc, hatch

Modify — copy, mirror, offset, fillet, extend, trim, stretch, explode, join, break at point

Dimension — linear dimension, aligned dimension, radius dimension, diameter dimension, angular dimension

Dimension heights and styles

Line types

Zoom — zoom all, zoom window

Layers — create

Vports — New Viewport

Guidance on approaches to assessment for this Unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

For Outcome 1, learners could be presented with architects/engineers drawings to show the various layouts adopted by different organisations showing various pieces of information such as; name of organisation, person responsible for the drawing, date, amendment number, scale, drawing title, specification/legend. Learners could prepare a drawing template for a given standard size of paper to include title panel and border. Drawings from Outcome 2 can be presented within the template to an appropriate scale by using layout wizards and viewports. Learners should be guided towards creating two finished drawings of a component/feature relevant to their mode of study. Drawings should be of a similar degree of difficulty to those shown in the Assessment Support pack (ASP).

Learners should produce two clear, well-presented, electronically generated CAD drawings, with suitable borders and title boxes, using a range of commands previously mentioned in this Unit.

National Unit Support Notes (cont)

Unit title: **Computer Aided Drafting: An Introduction (SCQF level 6)**

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 comparable standards are achieved. Where Centres develop their own assessment materials they should ensure it is prior verified before use.

Assessment will be continuous throughout the duration of this Unit whilst adopting an open-book approach.

There may be opportunities for Accreditation of Prior Learning (APL) for Learners who have undertaken the previous version of this Unit F3J8 12 *Computer Aided Drawing in Construction*. This is at the discretion of delivering centres. There is no automatic credit transfer.

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 Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all Learner 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)*.

Opportunities for developing Core Skills

In this Unit learners will be:

- ◆ interpreting written and graphical information from a given design.
- ◆ using CAD software to produce drawings.

Learners are offered the opportunity to develop aspects of Core Skills through:

Information and Communication Technology (ICT) Problem Solving

Components of *Problem Solving* Core Skills such as Planning and Organising, and Critical Thinking will be developed as learners undertake this Unit. Learners will need to take account of a range of factors in order to work efficiently such as the interpretation of drawings, calculation and measuring scales and sustainability issues relating to materials used in the manufacture of construction components.

There are opportunities to develop *Information and Communication Technology (ICT)* Core Skills by researching the availability of CAD generated drawings produced by suppliers/manufacturers of construction/civil engineering components.

National Unit Support Notes (cont)

Unit title: **Computer Aided Drafting: An Introduction (SCQF level 6)**

There are opportunities to develop *Numeracy* Core Skills through the interpretation of information from 3-dimensional working drawings.

There will be opportunities for learners to develop *Communication* Core Skills through the knowledge part of the assessment. As learners complete tasks with peer and lecturer assistance they will interpret specifications from suitable drawings and communicate component sizes and details required for completion of tasks.

This Unit has the Critical Thinking component of *Problem Solving* and the Providing/Creating Information component of *Information and Communication Technology* embedded in it. When learners achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking and Providing/Creating Information at SCQF level 4.

History of changes to Unit

Version	Description of change	Date

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General information for learners

Unit title: Computer Aided Drafting: An Introduction (SCQF level 6)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

This Unit is designed to enable you to understand the basic concept of Computer Aided Drafting. It is primarily aimed at learners with no previous knowledge of CAD although some knowledge of technical drawing would be an advantage. The Unit is intended to prepare you for articulation onto a Higher National course or SVQ relevant to professions within design, construction, architecture and civil engineering.

This Unit has two main areas of assessment although skills learned in one Outcome overlaps into the next allowing a seamless transition between Outcomes. Throughout your progress you will be encouraged to explore the software to enhance your creative ability. Early on a number of lessons will be delivered in small bite sized chunks thereafter you will be encouraged to practice these techniques and procedures to create a drawing relevant to your area of study. You are encouraged to communicate with your peer group and lecturer at relevant times throughout the duration of this Unit.

Assessment is (open-book) continuous throughout the extent of this Unit. You may bring notes and handouts that you have made personally or have been issued to you by your lecturer for your own use. You will not be permitted to bring other materials you have not prepared yourself or not issued by the class lecturer.

In this Unit you will be:

- ◆ interpreting written and graphical information from a given design.
- ◆ using CAD software to produce drawings.

You are also have the opportunity to develop aspects of Core Skills through:

- ◆ *Information and Communication Technology (ICT)*
- ◆ *Problem Solving*

Components of *Problem Solving* Core Skills such as Planning and Organising, and Critical Thinking will be developed as you undertake this Unit. You will need to take account of a range of factors in order to work efficiently such as the interpretation of drawings, calculation and measuring scales and sustainability issues relating to materials used in the manufacture of construction components.

There are opportunities to develop *Information and Communication Technology (ICT)* Core Skills by researching the availability of CAD generated drawings produced by suppliers/manufacturers of construction/civil engineering components.

There are opportunities to develop *Numeracy* Core Skills through the interpretation of information from 3 dimensional working drawings.

There will be opportunities for you to develop *Communication* Core Skills through the knowledge part of the assessment. As you complete tasks with peer and lecturer assistance you will interpret specifications from suitable drawings and communicate component sizes and details required for completion of tasks.

General information for learners (cont)

Unit title: Computer Aided Drafting: An Introduction (SCQF level 6)

This Unit has the Critical Thinking component of *Problem Solving* and the Using Graphical Information component of *Numeracy* embedded in it. When you achieve the Unit, your Core Skills profile will also be updated to show you have achieved Critical Thinking and Using Graphical Information at SCQF level 6.