Higher National Unit specification

General information

Unit title: Digital Imaging: Vector Techniques (SCQF level 7)

Unit code: HF87 34

Superclass: CE

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Source: Scottish Qualifications Authority

Version: 02

Unit purpose

This Unit is designed to allow the learner to explore digital imaging and vector creation techniques for computer applications. It will enable the learner to further explore vector graphics and gain more advanced technical knowledge of vector drawing software. In addition, the Unit requires learners to create design solutions with these skills which allow the learner to develop their creative thinking.

This Unit would be suitable for learners wishing to develop more advanced competence in vector graphics as it will develop an awareness of the importance of vector graphics and their appropriateness for inclusion within design work. Organisational skills are included in the preparation of materials for the incorporation into a larger project.

Outcomes

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

1 Demonstrate an understanding of vector graphics.
2 Produce a design(s) based on a project brief.
3 Use advanced features of a vector graphics package.

Credit points and level

1 Higher National Unit credit at SCQF level 7: (8 SCQF credit points at SCQF level 7)

Recommended entry to the Unit

Access to this Unit is at the discretion of the centre, however, learners should have been introduced to the basic functions of a computer and design software applications.

Higher National Unit specification: General information (cont)

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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 6 Planning and Organising 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.

This Unit is an optional Unit within the HNC Digital Design and Web Development and the PDA (Professional Development Award) Certificate in Digital Imaging at SCQF level 7.

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**.

Higher National Unit specification: Statement of standards

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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.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Demonstrate an understanding of vector graphics.

Knowledge and/or Skills

- Use of vector graphics
- Compression
- Output variations
- Hardware
- Copyright

Outcome 2

Produce a design(s) based on a project brief.

Knowledge and/or Skills

- Analysis of brief
- Explore creative concepts and possible solutions
- Present ideas

Outcome 3

Use advanced features of a vector graphics package.

Knowledge and/or Skills

- Acquire vector graphics
- Create vector graphics using appropriate software
- Manipulate vector graphics using appropriate software
- Edit vector graphics using appropriate software
- Implement vector graphics into an application

Higher National Unit specification: Statement of standards (cont)

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Evidence Requirements for this Unit

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills across all Outcomes.

The evidence for this Unit may be written or oral or a combination of these. Evidence may be captured, stored and presented in a range of media (including audio and video) and formats (analogue and digital). Particular consideration should be given to digital formats and the use of multimedia.

The Evidence Requirements for this Unit will take two forms:

1 Evidence of cognitive competence (Knowledge and Understanding) for Outcome 1.
2 Evidence of practical competence (practical abilities) for Outcomes 2 and 3.

For Outcome 1, candidates will be required to demonstrate that they will be able to:

- identify the use of vector graphics within different digital applications.
- describe what compression is and explain what compression is trying to achieve.
- define the difference between outputting graphics, eg for different media such as screen, print.
- identify and describe hardware devices used in the development of vector graphics.
- identify and describe current copyright issues associated with graphics, eg legislation, methods of copyright protection.

Sampling is permissible when the evidence for cognitive competence is produced by a test of knowledge and understanding. The test may take any form (including oral) but must be supervised, unseen and timed. The test must sample broadly and proportionately from the contents of the knowledge domain (see above). Access to reference material is not appropriate for this type of assessment.

Where re-assessment is required it should contain a different sample from the range of mandatory content.

For Outcome 2, candidates will be required to produce, in the most appropriate format, potential solutions to a given project brief. The candidate must produce a suitable design from their analysis. This should be evidenced by:

- analysis of the requirements of the project.
- results of research, eg printouts of webpages.
- clearly presented ideas, eg storyboards, mood boards, sketchbook, workbook, mockups or 3D equivalent where ideas and concepts are fully explored.

Higher National Unit specification: Statement of standards (cont)

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For Outcome 3, candidates will be required to provide evidence to demonstrate that they will be able to carry out the following practical activities in relation to a given project brief(s):

- Use appropriate vector graphics software.
- Produce design solutions. These should include vector graphics acquired from legitimate sources.
- Use a variety of appropriate tools and techniques to create, manipulate and edit vector graphics which include compound shapes and complex paths.
- Use at least one advanced feature of the software to create vector graphics.
- Apply the correct attributes for the chosen medium, eg resolution, image size, colour mode.
- Effectively organise layers and use appropriate naming conventions.
- Optimise graphics as appropriate for intended method of delivery: correct file formats, compression, resolution, colour mode and appropriate file size.
- Apply copyright protection to at least one graphic.
- Save graphics in a format suitable for future editing.
- Use suitable naming conventions and filing structure.
- Implement the completed graphics into the specified application(s).
- Submit all originals and edited versions of graphics electronically.

It is recommended that Outcomes 2 and 3 are integrated into one holistic assessment. However, these may be assessed individually if barriers are being placed on the learning process through this holistic approach.

Evidence for practical competence may be produced over an extended period of time under open-book conditions; but where it is generated without supervision some means of authentication must be carried out.

The Guidelines on Approaches to Assessment (see the Support Notes section of this specification) provides specific examples of instruments of assessment.

Higher National Unit Support Notes

Unit title: Digital Imaging: Vector Techniques (SCQF level 7)

Unit Support Notes are offered as guidance and 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.

This could be allocated as follows:

- Outcome 1 10 hours
- Outcome 2 10 hours
- Outcome 3 20 hours

Guidance on the content and context for this Unit

This Unit is one of a series of Units at Higher National level relating to digital media and web design and it can also be taught as a stand-alone Unit. This Unit builds on the knowledge and skills of F1YX 34 *Digital Imaging: Bitmap and Vector* and HF3F 34 *Digital Graphics Fundamentals*. Where learners have not achieved either of these Units, it is recommended that they have prior knowledge and skills in the creation of graphics.

The purpose of this Unit is to enable learners to acquire software skills to effectively undertake creative aspects of digital media projects and to work with vector software applications. The primary aim is to develop further understanding of vector graphics and the processes involved in creating them as opposed to teaching learners to be designers.

Outcome 1 covers the underpinning knowledge of the Unit. It is recommended that this is taught in the same context as Outcomes 2 and 3, as far as possible. The uses of vector graphics within a variety of applications should be explored, such as 2D and 3D animation, illustration and CAD. Discussion on compression would involve lossy, lossless, awareness of the different algorithms, artefacts caused, file formats and the balance between file size and quality.

Output variations would include factors such as resolution, colour modes, colour management and physical dimensions for different media, eg print, computer, mobile devices, TV, projector. Hardware used for creating vector graphics is likely to include graphics cards, graphics tablets and system specifications.

Copyright should include current legislation, possibly national and international, methods of copyright protection such as digital watermarks, and legitimate resources, eg stock graphics, libraries, creative commons.

Higher National Unit Support Notes (cont)

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For **Outcomes 2 and 3** learners should use software that relates to the design brief. At the time of writing, a number of applications were considered suitable for use in the delivery of this Unit. These include Adobe Illustrator, Corel Draw, 2D Animation software (eg Toon Boom) and 3D software (eg Maya and 3D Studio Max). Free online applications can be used but it is recommended that the software used is recognised by industry.

It is intended that one software application is taught for this Unit. Since learners have to use some advanced features of the software, it would be preferable to use an application that they have already been taught, particularly if they have completed either of the underpinning Units. Alternatively, if learners are being taught a new software application it should be one that would allow them to get sufficient exposure to some advanced features. Therefore, it would be expected that there is enough similarity with the basic features of the new software and the application learners have been previously taught, so as not to create a bigger learning curve.

Some examples of appropriate tools and techniques are pen, brush, text, stroke/fill colour, perspective, transformations, path manipulation, effects, bitmap converted to vector, ink modes, drawing tools, special characters, libraries. Learners should already be competent in using the fundamental tools without undue assistance, particularly if they have achieved any of the underpinning Units.

More advanced features of an application are usually highlighted by the software company (user guide, support materials). These will vary over time. It would not be feasible to teach all of these. Therefore, it is better to cover a few of more advanced features in order for learners to gain competence in using them without undue assistance. The features taught will differ based on the context of the Unit and assessment.

A variety of applications for vectors such webpage, screen, print, can be explored. It is recommended that only one is used for the rest of the Unit and for Outcome 3.

This Unit relates to the e-Skills IT User NOS (National Occupational Standards) and the Creative Skillset — Interactive Media and Computer Games NOS

Guidance on approaches to delivery of this Unit

This Unit is designed to enable the learner to explore digital imaging, gain technical knowledge of vector graphic software and to create digital pieces of work to a specific brief. Brief(s) can either be set as individual projects or holistically as part of an overall project. Learners are not expected to produce elaborate or sophisticated graphics as part of this Unit. As a guide learners could produce two to four graphics, though one piece of work would also be acceptable if it has involved the same amount of work and demonstration of skills.

The emphasis for this Unit should be on learner learning rather than on assessment. All topics should be covered in the learning activities.

This Unit may also be delivered in conjunction with the HN Unit HF86 34 *Digital Imaging: Bitmap Techniques* with the brief/s being used holistically to assess the Knowledge and Skills for the Units.

The knowledge covered in Outcome 1 could be taught in tandem with the practical skills of Outcomes 2 and 3. This approach may help learners to understand and digest concepts better. It is not compulsory to teach the knowledge and skills of this Unit in the order they have been presented in, although it is recommended, as the order has been applied in a natural sequence for learning this subject.

In Outcome 1, the learner should undertake a closed-book assessment comprising of a set of questions.

In Outcome 2, emphasis should be placed on the process used for creating vector graphics and the individual's interpretation of the project. Ideas, once formalised, should be analysed and fully explored. Selection of a final project may be made in conjunction with the assessor. A considered use of media should be included in the evidence. The primary aim is to develop an understanding of vector graphics and the processes involved in creating them, as opposed to teaching learners to be designers.

In Outcome 3, the learner should use advanced vector graphics software features to create digital imagery to a given brief(s).

Guidance on approaches to assessment of 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 candidates.

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

Candidates are encouraged to use the internet in any research, however, the evidence produced must be the candidate's own words. Assessors should ensure that the evidence provided is the candidate's own work.

Written and/or oral recorded, performance and product evidence is required to demonstrate that the candidate has achieved the requirements of all of the Outcomes, and to show that the candidate has appropriate knowledge and understanding of the content of this Unit.

This Unit should be assessed by the assessment tasks detailed as follows:

1 Assessment for Outcome 1 is a closed-book assessment and should take the form of a set of questions, where the candidate will demonstrate their knowledge of the fundamentals of digital graphics. The assessment will be supervised, controlled and presented under closed-book conditions. The assessment should last no more than 1 hour. The instrument of assessment must provide opportunities for the Outcome to be achieved by sampling across the range of content for Outcome 1. This assessment must change on each assessment occasion. Achievement can be decided by use of a 60% cut-off score.

2 Assessment for Outcome 2 is an open-book assessment and should take the form of a practical assessment carried out under supervised conditions. The assessment is designed to demonstrate the candidate's knowledge and/or skills in producing designs to a given brief.

3 Assessment for Outcome 3 is an open-book assessment and should take the form of a practical assessment carried out under supervised conditions. The assessment should be designed to demonstrate the candidate's knowledge and/or skills in creating, manipulating and optimising vector graphics. There must be a checklist submitted which records that the candidate has achieved all necessary items from the Evidence Requirements, and this checklist must be endorsed by the assessor with their name, signature and date.

Assessments for Outcomes 2 and 3 can be integrated into one holistic assessment. The practical assessments within this Unit should be based on the same case study.

Assessors should ensure themselves of the authenticity of the candidate's evidence.

Candidates could be given a range of themes to choose from or select their own them from a source agreed by the assessor. Where learners select their own theme this must be approved by the assessor.

Throughout the development it is recommended that all work is organised and contained in a production folder.

Opportunities for 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. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at **www.sqa.org.uk/e-assessment**.

Opportunities for developing Core and other essential skills

This Unit requires that learners **analyse** a given brief and provide solutions to the brief. There may be opportunities to gather evidence for the *Problem Solving* Core Skill at an appropriate level.

This Unit has the Critical Thinking and Planning and Organising components of Problem Solving embedded in it. This means that when learners achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.

History of changes to Unit

Version	Description of change	Date
02	Core Skills Components Critical Thinking and Planning and Organising at SCQF level 6 embedded.	16/11/2016

General information for learners

Unit title: Digital Imaging: Vector Techniques (SCQF level 7)

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 allow you to develop skills relating to management of digital and computer technology within the design process in the creation of vector graphics project. It will enable you to explore vector graphics and to create digital pieces of work to gain technical knowledge of vector drawing software to a specific brief. Brief(s) can either be set as individual projects or holistically as part of an overall project. Learners are not expected to produce elaborate or sophisticated graphics as part of this Unit.

This Unit is split into three areas and concentrates on the following:

1 Demonstrate an understanding of vector graphics.
2 Produce a design(s) based on a project brief.
3 Use advanced features of a vector graphics package.

Throughout this Unit, you will gain practical skills in a vector creation software application.

Outcome 1 relates to the theoretical elements of vector graphics — file types, compression, hardware, software, graphics for web and print, print output settings and copyright issues. Assessment for this Outcome is by means of a series of questions.

In Outcome 2, the emphasis is placed on the process used for creating vector graphics and the individual's interpretation of a design brief. The primary aim is to develop an understanding of graphics and the processes involved in creating them as opposed to teaching someone to be a designer. Assessment for this Outcome requires you to generate work from a given project briefs.

In Outcome 3, you will use advanced vector software to create vector graphics. Assessment for this Outcome is practical, and you will be required to produce vector graphic versions of design solutions for given project brief(s).

An assessor may ask you to explain parts of your work to authenticate the evidence.

In order to complete this Unit successfully you will be required to demonstrate you have successfully actioned all three Outcomes.

This Unit has the Critical Thinking and Planning and Organising components of Problem Solving embedded in it. This means that when you achieve the Unit, your Core Skills profile will also be updated to show you have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.