# Higher National Unit specification

## General information

**Unit title:**  CAD: 3D Animation (SCQF level 8)

**Unit code:**  F214 35

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| **Superclass:** | CH |
| **Publication date:** | February 2008 |
| **Source:** | Scottish Qualifications Authority |
| **Version:** | 03 (July 2016) |

## Unit purpose

This Unit is designed to introduce learners to the role of 3D animation within the design process. This Unit allows the learner to develop knowledge and skills which will allow them to understand the processes involved in the preparation and development of 3D animations in an industrial context.

## Outcomes

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

1    Create a computerised 3D environment for animation in response to a given brief.
2    Create a 3D animated sequence for component simulation.
3    Create a 3D animated sequence incorporating architectural detail.
4    Develop a presentation incorporating 3D rendered stills and animation.

## Credit points and level

2 Higher National Unit credits at SCQF level 8: (16 SCQF credit points at SCQF level 8)

## Recommended entry to the Unit

While entry to this Unit will be at the discretion of the centre, it is recommended that learners possess a basic knowledge and understanding of design and Computer Aided Design in particular. This may be evidenced by the possession of the following HN Units DW18 34 *CAD: Visualisation, Rendering and Presentation*, HE27 34 *CAD: 3D Surface and Solid Modelling*, DW17 34 *Design Methodology*, or any equivalent level of study.

**Higher National Unit specification: General information (cont)**

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## Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this Unit specification.

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

## 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 was developed for the HNC/HND Computer Aided Draughting and Design.

## 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.

# Outcome 1

Create a computerised 3D environment for animation in response to a given brief.

## Knowledge and/or Skills

♦ Design brief
♦ Concept generation
♦ 3D modelling techniques
♦ File transfer techniques
♦ Materials
♦ Texture mapping coordinates
♦ Lighting
♦ Cameras
♦ Rendering output techniques

# Outcome 2

Create a 3D animated sequence for component simulation.

## Knowledge and/or Skills

♦ Design brief
♦ Storyboard development
♦ Materials
♦ Lighting
♦ Cameras
♦ Component animation
♦ Keyframing
♦ Rendered output options

# Outcome 3

Create a 3D animated sequence incorporating architectural detail.

## Knowledge and/or Skills

♦ Storyboard development
♦ Lighting animation
♦ Materials
♦ Camera animation
♦ Keyframing
♦ Path constraints

# Higher National Unit specification: Statement of standards (cont)

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## Outcome 4

Develop a presentation incorporating 3D rendered stills and animation.

### Knowledge and/or Skills

♦ Presentation design considerations

### Evidence Requirements for this Unit

#### Outcome 1

Learners will need to provide evidence to demonstrate all Knowledge and/or Skills by showing that they can:

♦ interpret a design brief and generate concept ideas for the modelling of a 3D environment.
♦ create a computerised 3D environment within a visualisation and animation system.
♦ transfer files into the 3D visualisation environment from an external source.
♦ create, manipulate and apply at least four different materials in a computerised 3D environment, one of which must show evidence of texture mapping.
♦ add and control lighting in a 3D environment.
♦ add and control cameras in a 3D environment.
♦ produce a minimum of three rendered stills of a computerised 3D environment.

Evidence should be generated through assessment undertaken as open-book in a supervised environment. Learners should be allowed to refer to relevant course material.

#### Outcome 2

Learners will need to provide evidence to demonstrate all Knowledge and/or Skills by showing that they can:

♦ in response to a given design brief, develop a storyboard and produce a 3D animated sequence for component animation which shows application of materials, optimum use of lighting, camera positions and keyframing.
♦ produce rendered output in a format that can be played back in most readily available media players.

Evidence should be generated through assessment undertaken as open-book in a supervised environment. Learners should be allowed to refer to relevant course material.

# Higher National Unit specification: Statement of standards (cont)

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### Outcome 3

Learners will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

♦ in response to a given design brief, develop a storyboard and produce a 3D animated sequence incorporating architectural detail that, includes the manipulation of colour and intensity of lighting, shows application of at least four materials and demonstrates camera animation, keyframing and path constraints techniques in a format that can be played back in most readily available media players.

Evidence should be generated through assessment undertaken as open-book in a supervised environment. Learners should be allowed to refer to relevant course material.

### Outcome 4

Learners will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

♦ in response to a design brief, develop an electronic presentation incorporating 3D rendered still images and animated sequences with supporting annotation, use of complementary colour pallet for background and control of scale and proportion for both annotation and images within the composition.

Evidence should be generated through assessment undertaken as open-book in a supervised environment. Learners should be allowed to refer to relevant course material.

# Higher National Unit Support Notes

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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 80 hours.

## Guidance on the content and context for this Unit

This Unit has been written in order to allow learners to develop knowledge and skills in the development and preparation of computerised 3D environments for animation in response to a given design brief, creation of a 3D animated sequence for component simulation, creation of a 3D animated sequence incorporating architectural detail and, finally, the development of a presentation incorporating 3D rendered stills and animated sequences.

This Unit is at SCQF level 8 and has been devised as a mandatory Unit within the HND Computer Aided Draughting and Design award. However, this does not preclude the use of the Unit in other awards where award designers feel this to be appropriate.

In designing this Unit, a range of topics have been identified that could be utilised by lecturers to contextualise the Unit. There will possibly be a disparity in the depth of treatment given to the topics attached to each of the Outcomes. A list of potential topics for each Outcome is given below.

**Outcome 1**

Create a computerised 3D environment for animation in response to a given brief specification.

It is recommended that the 3D environments created in Outcome 1 should be taken forward to animation in Outcomes 2 and 3 with the final output for Outcomes 1, 2 and 3 forming the basis of the presentation in Outcome 4.

In Outcome 1 the learner should be able to develop computerised 3D environments in preparation for animation. The learner is required to use a 3D visualisation and animation system and demonstrate knowledge and skills in the following competencies:

♦ Development of concepts that aim to satisfy the given design brief specification. Learners should demonstrate their ability to analyse a given brief. This may be evidenced by the production of rendered stills that show the learner's use of materials, lighting, cameras and 3D modelling techniques in response to the given brief.

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♦ Use of 3D modelling and importation tools for the development and preparation of computerised 3D environments. Learners may be given or self-produce 3D models from a variety or external sources and this should be combined with any 3D geometry created within the visualisation animation software required to complete the 3D scene. Learners will instinctively become familiar with advantages and disadvantages of file types when importing files from external sources into the 3D visualisation and animation system.

♦ Creation, manipulation and application of materials within computerised 3D environments. Learners may be given the opportunity to experiment with material selection from the material library, as well as the creation of material finish, eg using textures and maps, reflective, transparent and bump. Learners will gain knowledge, understanding and practical skills in the application of materials and mapping coordinates.

♦ Creation and positioning of lights within computerised 3D environments. The learner should be given the opportunity to experiment with lighting effects, ie intensity, colour and shadows.

♦ Creation and positioning of cameras within computerised 3D environments. Learners should demonstrate control of positioning and field of view (FOV).

♦ Creation of rendered stills in an appropriate format, eg JPEG, TIFF, GIF, etc. Learner should consider why the rendered output is required, as this will help determine the best output file. Learners should also show consideration for image size, resolution and file size.

**Outcome 2**

Create a 3D animated sequence for component simulation.

In this Outcome the learner should be able to plan and create a 3D animated sequence for component simulation within a visualisation and animation system.

♦ Planning of the 3D animated sequence through the development of a sketched storyboard. The storyboard should provide commentary on camera positioning, lighting options, component movement and manipulation, number of frames and at what frame events take place within the animation, etc.

♦ Creation of a 3D component animation which clearly demonstrates two manipulation options:
— component movement
— component rotation
— component scaling

♦ Learners should show an understanding in the practical application of keyframing techniques in the production of this animation.

♦ Creation of a rendered animation in a current output format, eg AVI. Learners should consider why the rendered output is required, as this will help determine the most suitable output file. Learners should also show consideration for image size, resolution and file size.

♦ Materials

♦ Lighting

♦ Cameras

## Higher National Unit Support Notes (cont)

**Unit title:**     CAD: 3D Animation (SCQF level 8)

**Outcome 3**

Create a 3D animated sequence incorporating architectural detail.

In this Outcome the learner should be able to plan and create a 3D animated sequence for architectural development within a visualisation and animation system.

♦   Planning of the 3D animated sequence through the development of a sketched storyboard. The storyboard should provide commentary on camera positioning and animation, lighting animation, component movement and manipulation, number of frames and at what frame events take place within the animation, etc.
♦   Creation of an animated sequence showing an architectural development that incorporates animated lighting, eg colour and/or intensity change, camera animation, eg walkthrough using path constraint techniques.
♦   Learners should show an understanding in the practical application of keyframing techniques in the production of this animation.
♦   Creation of a rendered animation in an appropriate format, eg AVI. Learners should consider why the rendered output is required, as this will help determine the most suitable output file. Learners should also show consideration for image size, resolution and file size.

**Outcome 4**

Develop a presentation incorporating 3D rendered stills and animation.

In this Outcome the learner should be able to create an electronic visual presentation. The learner will experiment with backgrounds and annotation. The learner will also show consideration for the presentation composition, eg positioning, scale and orientation of named elements.

## Guidance on approaches to delivery of this Unit

It is intended that this Unit is presented at all times using the specialist application CAD visualisation and animation software available at the centre, with appropriate technical and support material available to the learners.

In delivery of this Unit, learners should be provided with the opportunity to gain as much 'hands on' experience as possible. Each learner should have access to a PC with the CAD software installed.

# Higher National Unit Support Notes (cont)

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## 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 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.

All assessments for this Unit are undertaken as open-book in a supervised environment. All assessment could be stand-alone tasks if required. However a design brief would be an ideal assessment task to provide the necessary opportunities for the learner to develop the required evidence and would allow integration of assessment for all Outcomes. Learners may bring into the assessment venue relevant course materials to refer to although centres should implement any necessary safeguards to ensure that evidence generated is the learner's own work.

Suggested work up times have been provided as guidance for each assessment.

**Assessment Guidelines**

**Outcome 1**

It is recommended that sufficient time is allocated for the assessment, and a work up time of approximately 4 hours should be sufficient. It would be helpful to centres if they develop checklists to support the recording of Evidence Requirements for each of the Outcomes.

**Outcome 2**

It is recommended that sufficient time is allocated for the assessment, and a work up time of approximately 4 hours should be sufficient. It would be helpful to centres if they develop checklists to support the recording of Evidence Requirements for each of the Outcomes.

**Outcome 3**

It is recommended that sufficient time is allocation for the assessment, and a work up time of approximately 4 hours should be sufficient. It would be helpful to centres if they develop checklists to support the recording of Evidence Requirements for each of the Outcomes.

**Outcome 4**

It is recommended that sufficient time is allocation for the assessment, and a work up time of approximately 2 hours should be sufficient. It would be helpful to centres if they develop checklists to support the recording of Evidence Requirements for each of the Outcomes.

# Higher National Unit Support Notes (cont)

**Unit title:** CAD: 3D Animation (SCQF level 8)

## 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

There are opportunities to develop the Core Skills of *Communication, Problem Solving, Information and Communication Technology (ICT)* and the Core Skill of *Numeracy* all to SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

*Problem Solving* is used in interpreting the brief and for storyboarding and manipulating and modifying animated solutions. *ICT* and *Numeracy* skills are used when using different file types, transferring files and using different software applications to produce high end graphics.

## History of changes to Unit

| Version | Description of change | Date |
|---------|----------------------|------|
| 03 | No change to context. Some minor changes to correct errors/typos and transferred to the current template. | 06/07/16 |
| 02 | Superclass changed from VF to CH. | 26/06/13 |
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# General information for learners

## Unit title: CAD: 3D Animation (SCQF level 8)

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 introduce you to the role of 3D animation within the design process. It will provide you with knowledge and skills that will enable you to understand the concepts of CAD: 3D Animation and the processes involved in the preparation and development of 3D animations. On completion of the Unit you will be able to:

1   Create a computerised 3D environment for animation in response to a given brief.
2   Create a 3D animated sequence for component simulation.
3   Create a 3D animated sequence incorporating architectural detail.
4   Develop a presentation incorporating 3D rendered stills and animation.

There are four Outcomes in this Unit. In Outcome 1 you will learn about the development of computerised 3D environments in preparation for animation through the use of a 3D visualisation and animation system. In Outcome 2 you will plan and create a 3D animated sequence for component simulation within a visualisation and animation system. In the third Outcome you will plan and create a 3D animated sequence incorporating architectural detail within a visualisation and animation system.

In the final Outcome you will create an electronic visual presentation. You will experiment with backgrounds, text, imported images and animation of 3D solutions. You will be required to show consideration for the presentation's composition.

There may be opportunities to develop the Core Skills of *Communication, Problem Solving, Information and Communication Technology (ICT)* and the Core Skill of *Numeracy* all to SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

All assessments for this Unit are undertaken as open-book in a supervised environment and may be stand-alone tasks. However a design brief may be provided which contains the necessary opportunities for you to develop the required evidence and would allow integration of assessment for all Outcomes. Learners may bring into the assessment venue relevant course materials to refer to in order to fulfil the creative tasks although centres should implement any necessary safeguards to ensure that evidence generated is the learner's own work.