National Unit specification: general information

Unit title: Computer Games: 3D Modelling and Animation Skills (SCQF level 6)

Unit code: H2CF 12

Superclass: CE

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Source: Scottish Qualifications Authority

Version: 01

Summary

The purpose of this Unit is to provide candidates with the knowledge and skills to create an animated 3D sequence within a built environment. Candidates will gain an understanding of the principles of planning a 3D animation as well as developing their practical skills by producing an animated piece.

This is an optional Unit in the National Certificate in Computer Games Development, suitable for candidates who have no previous experience in graphic design and/or 2D/3D animation, or those who are interested in developing 3D modelling and/or animation skills.

Outcomes

1 Plan a 3D animated sequence.
2 Produce a 3D model and an environment for an animated sequence.
3 Animate and render a 3D sequence.
4 Evaluate a 3D animated sequence.

Recommended entry

Entry is at the discretion of the centre, although basic computer skills would be recommended.

Credit points and level

1 National Unit credit at SCQF level 6: (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.*

General information (cont)

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Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes of this Unit specification.

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

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

Plan a 3D animated sequence.

Performance Criteria

(a) Produce drawings of the proposed 3D model(s) and environment from three viewpoints: front, side and perspective.
(b) Identify the key frames in the sequence.
(c) Produce annotated storyboards for the key frames of the planned animated sequence.
(d) Produce detailed timelines identifying each stage of the production.

Outcome 2

Produce a 3D model and an environment for an animated sequence.

Performance Criteria

(a) Produce at least one 3D model suitable for animation.
(b) Produce an environment within which the animation will take place.
(c) Apply textures to the model(s) and environment.
(d) Apply appropriate lighting to the scene.

Outcome 3

Animate and render a 3D sequence.

Performance Criteria

(a) Apply animation to the 3D model(s).
(b) Use graph editor software.
(c) Render the animation.
(d) Save the animation in an appropriate file format.

National Unit specification: statement of standards (cont)

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Outcome 4

Evaluate a 3D animated sequence.

Performance Criteria

(a) Justify the effectiveness of the sequence in relation to produced plans, citing strengths and weaknesses and methodologies used.
(b) Justify any alterations required if applicable.
(c) Identify areas of improvement.

Evidence Requirements for this Unit

The following written/oral/product evidence is required to demonstrate that candidates have achieved all of the Outcomes and Performance Criteria:

- Three drawings of the proposed 3D model and three drawings of the environment that the candidate plans to create/model. One from each viewpoint is required: front, side and perspective.
- A set of storyboards portraying the animation.
  The storyboards should accurately reflect the final animation sequence in relation to time and direction. The storyboards should identify the key frames of the animation; this will dictate the number of storyboard panels required.
- Detailed timelines identifying each stage of the production.
- At least one 3D model suitable for animation, and an environment.
- Textures and appropriate lighting must be applied.
- An animated sequence of no less than fifteen seconds.
  The animation need not be of a complex or narrative nature, but the model must be animated and demonstrate the use of a graph editor (this could be evidenced with a screen grab/print screen).
- The animated sequence must be rendered and saved in an appropriate file format.
- An evaluation of the planning documentation and whether the plans were effective, highlighting areas of improvement and whether alterations were required.

National Unit specification: support notes

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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

In this Unit, candidates are required to plan and produce a 3D animation lasting no less than 15 seconds. The Unit is designed so that the complexity of the modelling and animation is flexible. Candidates with no prior experience of 3D modelling and/or animation could produce a basic 3D model (such as a cube, sphere, cylinder, etc), apply a simple texture and then apply some basic animation to the model. An example would be the production of some 3D text, such as candidate's name; applying a texture to the text, then animating the text rotating/scaling/moving on a single axis for 15 seconds. The environment could be a simple ground plan with a wood texture applied to it, or another indoor/outdoor setting. Candidates could use a graph editor to manipulate value/time, easing-in/out of a key frame. Candidates with prior knowledge of 3D modelling/animation would be able to produce a more complex animated piece and more complex manipulation, eg loops, relative loops, etc.

Guidance on learning and teaching approaches for this Unit

Practical activities should be lecturer-led in that techniques and processes should be explained clearly, demonstrated and understood by candidates prior to undertaking the practical tasks, eg modelling methods, texturing methods, lighting techniques, animation techniques and graph editor manipulation techniques.

During this Unit, candidates will learn about planning an animation. This will include drawing techniques (for the proposed model(s) and environment), which may include shaded renderings, drawings that explore form and texture, and perspective drawings. The drawings can be hand-drawn or computer generated, black and white or in full colour.

Candidates will also learn about the storyboarding process for animation; identifying the key frames in the animation, and portraying these in storyboard format. Again, the storyboards can be hand-drawn or computer generated, black and white or in full colour. A 15 second animation may only require 6–12 frames, whereas a longer, more complex piece would require more frames.

Candidates will learn how to produce a 3D model and an environment in an appropriate software package. This will introduce them to the interface of the software, and they will learn basic modelling techniques. Candidates will also learn texturing techniques, whether simply assigning a colour to their model(s), or using bitmapping/procedural mapping techniques. Candidates may populate their scene by importing pre-modelled assets.

The model produced can be basic in nature (such as a cube or sphere), or a more complex model if the software being used is familiar.

National Unit specification: support notes (cont)

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Candidates will learn about animation techniques, whether basic, such as moving a model on one axis and recording the motion, or positional, rotational, scaling animation or more complex animation, eg such as assigning the model to a motion path.

Candidates will also learn graph editing techniques. This could range from manipulating a key frame's value/time to manipulating the behaviour of the animation coming into or out of a key frame, eg ease-in/ease-out.

Candidates will learn basic lighting skills. The model and the environment should be visible throughout the animation, therefore should be lit appropriately. This could be as simple as introducing an omni-directional light, or a more complex, three-point set up could be implemented. Candidates will also learn how to render an animation to an appropriate file format (such as AVI, FLV, Mpeg, etc.) and save to backing storage.

Candidate will evaluate their animated sequence, citing strengths and weaknesses, methodologies used and a reflective commentary on what they would do differently if undertaking the task again.

Guidance on approaches to assessment for this Unit

The following approaches to assessment are suggested:

Digital or paper portfolio containing a selection of drawings and storyboards

Digital portfolio containing models, environments and file of animated sequence

Written and/or oral report

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 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)*.

Opportunities for developing Core Skills

There is no automatic certification of Core Skills or Core Skill component in this Unit. However, *Problem Solving* (Outcome 1 — Planning), Numeracy (Outcome 2 — parametric modelling) and *Information and Communication Technology (ICT)* (Outcomes 2 and 3) will contribute to Core Skills development.

National Unit specification: support notes (cont)

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This Unit maps to the following National Occupational Standards:

IM05 Design User Interfaces for Interactive Media Products
IM20 Design Electronic Games
IM23 Create Narrative Scripts for Interactive Media Products
IM24 Create 2D Animations for Interactive Media Products

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**

History of changes to Unit

Version	Description of change	Date