Higher National Unit specification

General information for centres

Unit title: 3D Computer Animation and Technical Direction: Advanced

Unit code: F1GV 35

Unit purpose: The Unit will provide, or enhance, the candidate's knowledge of 3D computer animation and technical direction, and will allow the candidate the opportunity to explore a range of complex animation techniques.

On completion of the Unit the candidate should be able to:

1   Describe and evaluate advanced 3D computer animation techniques.
2   Produce developmental designs and storyboards for a proposed 3D computer animation.
3   Create motion graphics using advanced computer animation tools, techniques and technical direction.

Credit points and level: 2 HN credits at SCQF level 8: (16 SCQF credit points at SCQF level 8*)

*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.

Recommended prior knowledge and skills: Access to this Unit is at the discretion of the centre. However, it would be beneficial if the candidate had some knowledge of 3D computer graphics and animation techniques and was proficient in computer use including saving files in a methodical way. This may be evidenced by the possession of relevant HN Units DW94 34 *3D Animation Motion Studies*, DW9J 34 *Animation: An Introduction*, DW9G 34 *3D Computer Visualisation* or prior experience.

Core Skills: There are opportunities to develop the Core Skills of Information Technology, Problem Solving and Communication at SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

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.

Assessment: A single instrument of assessment that would require candidates to produce a 3D computer animation, and supporting personal journal could assess this Unit. The animation should be submitted in an appropriate broadcast format.

Assessment could also be carried out as three separate assessment events.

Higher National Unit specification: statement of standards

Unit title: 3D Computer Animation and Technical Direction: Advanced

Unit code: F1GV 35

The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

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. Candidates 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

Describe and evaluate advanced 3D computer animation techniques

Knowledge and/or Skills

♦   Research skills
♦   3D computer animation techniques
♦   Analytical skills

Evidence Requirements

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

♦   research, contextualise, and evaluate material which accurately describes 3D computer animation techniques
♦   accurately describe advanced 3D computer animation techniques including key framing, inverse kinematics, motion graphs, dope sheets, motion capture, particle systems, multipass rendering, multipass layering and character rigging
♦   give examples of six of the aforementioned advanced 3D computer animation techniques, as demonstrated in a range of media texts

Evidence should be presented as a written report or an oral presentation.

Assessment Guidelines

The assessment of this Outcome can be combined with Outcomes 2 and 3 as part of a single assessment for the Unit, details of which are given under Outcome 3 below.

Higher National Unit specification: statement of standards (cont)

Unit title: 3D Computer Animation and Technical Direction: Advanced

Outcome 2

Produce developmental designs and storyboards for a proposed 3D computer animation

Knowledge and/or Skills

- Visualisation skills
- Reference drawing
- Storyboarding production
- Storyboard formats
- Time management

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can, in relation to a given or agreed brief:

- produce reference images/drawings of proposed models relevant to the brief
- produce a workbook outlining the different stages of research selection and possible solutions
- produce sketches, images or drawings as a workbook or appropriately stored computer visualisations
- produce industry standard storyboards that reflect the design brief

The number of storyboards produced will be determined by the number of key frames required to articulate motion using the principles of 24fps in a segment that demonstrates the requirements of the brief.

Assessment Guidelines

The storyboard should articulate the choices made by the candidate and provide evidence of the key requirements of the proposed motion/movement of the character or model.

Evidence should be presented as a workbook that contains exemplars showing that the candidate understands and is capable of evaluating the motion requirements for the proposed model within the timeframe available. Oral discussion with the tutor should be used to reinforce this.

The assessment of this Outcome can be combined with Outcomes 1 and 3 as part of a single assessment for the Unit. It would be possible, if desired, to break this assessment down into three separate assessment events with each Outcome assessed separately.

Higher National Unit specification: statement of standards (cont)

Unit title: 3D Computer Animation and Technical Direction: Advanced

Outcome 3

Create motion graphics using advanced computer animation tools, techniques and technical direction

Knowledge and/or Skills

- Key-framing
- Interpolation
- Inverse Kinematics application
- Character rigging
- Technical direction
- Editing motion graphs
- Animated particle systems
- Storage devices

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can, in relation to a given or agreed brief:

- create a technically directed animated sequence, which must include at least three of the following techniques: Key-framing, Interpolation, Inverse Kinematics, Character Rigging, Motion Graph Editing, Animated Particle Systems
- create keyframes and interpolation appropriate to brief, in a sequence lasting no less than 20 seconds
- save final rendered animation using appropriate formats and available storage devices
- replicate 3D movement in an animated sequence which demonstrates Inverse Kinematics

Assessment Guidelines

The assessment of this Outcome can be combined with Outcomes 1 and 2 as part of a single assessment for the Unit. It would be possible, if desired, to break this assessment down into three separate assessment events with each Outcome assessed separately.

The final animated sequence need not feature elements of narrative form or structure.

Administrative Information

Unit code: F1GV 35

Unit title: 3D Computer Animation and Technical Direction: Advanced

Superclass category: JB

Original date of publication: April 2007

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History of changes:

Version	Description of change	Date

Source: SQA

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre for further details, telephone 0845 279 1000.

Higher National Unit specification: support notes

Unit title: 3D Computer Animation and Technical Direction: Advanced

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 80 hours.

Guidance on the content and context for this Unit

The Unit is intended to introduce the candidate to, or enhance the candidate's knowledge of 3D computer animation and technical direction, and will allow the candidate the opportunity to explore a range of simple and complex animation techniques.

This Unit is primarily designed to provide candidates with knowledge on 3D computer animation and technical direction techniques. The Unit will assist candidates in appreciating the breadth of animation techniques available to them in delivering 3D computer animation graphics.

It would be helpful if candidates could observe and experience a wide range of animation techniques delivered by professionals within a commercial setting.

A brief may be supplied by the tutor or negotiated with the candidate and be based on an appropriate range of characters or concepts which would fully address the range of knowledge, skills and evidentiary requirements for integrated or separate assessment.

Guidance on the delivery and assessment of this Unit

This Unit has been developed as part of the HND Computer Art and Design Award. It is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Opportunities may be taken to link or integrate with other aspects of the course and a thematic approach adopted for both delivery and assessment.

Outcome 1 requires the candidate to produce a report or an oral presentation accurately describing advanced 3D computer animation techniques including keyframing, Inverse Kinematics, motion graphs, dope sheets, motion capture, particle systems, multipass rendering, multipass layering and character rigging. The report should include examples of these techniques as demonstrated in a range of media texts. The candidate should utilise both the Internet and the help files of an appropriate software package to carry out research relating to the techniques requiring description.

Outcome 2 requires the candidate to produce conceptual designs for a proposed 3D model. A brief should be supplied by the tutor or negotiated with the candidate. The brief must include an appropriate range of characters or concepts that would fully address the range of knowledge, skills and Evidence Requirements.

In order to meet the Evidence Requirements, it is recommended that the candidate aims to produce an animated sequence of no less than three minutes. However, if all Evidence Requirements were met in a sequence lasting less than three minutes, the submission would be acceptable.

Higher National Unit specification: support notes (cont)

Unit title: 3D Computer Animation and Technical Direction: Advanced

The candidate should carry out research on existing structures/objects to enhance realism, or merely for inspiration. Research selection and possible solutions should be presented in the form of a workbook. Enquiry into character, visual material properties, of shape and form, primary and secondary planes and surfaces angles should be sketched out.

The candidate must then produce reference images/drawings of the proposed model. These may be computer-generated, hand-drawn or composite images. The purpose of the conceptual design work is to introduce the candidate to the industry-standard practice of pre-production development.

The candidate should produce clear and precise model sheets, including front, side and back views of the proposed model. The model sheets can be hand drawn or computer-generated and printed out, and added to the workbook.

The sketches should articulate development of the model from front, back, side views, supported by a rough sketch, colour sampled sketches and fully detailed and articulated final model. Reference will also be required detailing material sourced or developed to render the final model.

The candidate must produce sufficient storyboards to reflect movement and action across the length of the segment. The storyboards can be hand drawn or computer-generated, printed out, and added to the workbook. The number of storyboards will be determined by the number of key frames required to articulate motion using the principles of 24 fps in a segment that reflects the requirements of the brief.

Outcome 3 requires the Candidate to use animation tools and techniques to create a 3D computer animation. The purpose of this Outcome is to introduce the candidate to some of the fundamental principles of 3D model motion. The Outcome will introduce the candidate to advanced 3D animation techniques which can include key-framing, interpolation, model deformation techniques, Inverse Kinematics, technical direction, editing motion graphs, animated particle systems, multipass rendering, multipass layering and character rigging. The Outcome also requires that the Candidate include at least three of the aforementioned advanced techniques from a range supplied by the tutor. These requirements challenge the Candidate to incorporate techniques that are key in the creation of 3D animated motion.

Given the motion-orientated nature of the Unit, the animated sequence need not feature elements of narrative form or structure.

The final rendered animation should then be saved using appropriate formats and available storage devices.

Assessment guidance has been referenced under each Outcome.

Opportunities for developing Core Skills

Candidates will enhance skills in the practical use of Information Technology naturally, and to a sophisticated level, as they manage the practical aspects of creating an animation sequence to a given brief. Facilitating access to appropriate software will provide essential support for the progressing of design skills. Accessing sources which provide a broad range of examples of computer animation and discussion with the group and assessor would reinforce analytical and evaluative approaches to the design process. Effective and responsible use of equipment and software would be integral to achievement.

Higher National Unit specification: support notes (cont)

Unit title: 3D Computer Animation and Technical Direction: Advanced

In planning to meet the practical requirements of a brief such variables as available resources and appropriate media will be identified naturally and the significance of each examined and analysed before design approaches are selected. Developing and implementing initial design concepts should further provide opportunities for enhancing creative problem solving skills to an advanced level. Evaluation which examines all stages of proposed design solutions and their potential and actual impact will be on-going.

Candidates must research, analyse, and evaluate complex information on Animation techniques from a range of sources. They should produce and present written and oral materials to standards acceptable in industry, and express essential ideas, information accurately and coherently, using industry terminology. Information they communicate must be accurate, detailed and effectively presented to meet the needs of purpose and users. Reporting may be oral or written, and a range of media would be produced to support oral work. Presentations should demonstrate that candidates are able to:

♦   collate, organise and structure accurate information effectively
♦   signpost key points
♦   produce storyboards with impact
♦   use appropriate non-verbal communication techniques
♦   respond to questions in a way that progresses communication

Open learning

This Unit could be delivered by distance learning provided opportunities to attend workshops and demonstrations could be incorporated to ensure appropriate mentoring of candidate progress.

It may be appropriate under the circumstances that distance-learning candidates engage in the single assessment option rather than the Outcome-by-Outcome assessment.

For information on normal open learning arrangements, please refer to the SQA guide, *Assessment and Quality Assurance of Open and Distance Learning* (**www.sqa.org.uk**).

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**).

General information for candidates

Unit title: 3D Computer Animation and Technical Direction: Advanced

The Unit will enhance your knowledge of advanced 3D computer animation and technical direction, and will allow you the opportunity to explore a range complex animation techniques.

A brief will be supplied by your tutor or negotiated with you based on an appropriate range of characters or concepts.

For **Outcome 1** you will produce a report or presentation accurately describing advanced 3D computer animation techniques. Your report will include media examples that incorporate a wide range of animation techniques. You may make use of a variety of methods to carry out research relating to the techniques you have been asked to describe.

For **Outcome 2** you will produce conceptual designs of a proposed 3D model. You will carry out research on existing structures/objects to enhance realism, or merely for inspiration.

You will then go on to produce reference images/drawings of a proposed model. These may be computer-generated, hand-drawn or composite images. This process will introduce you to the industry-standard practice of pre-production development.

You will produce sufficient storyboards to reflect movement and action across the length of the segment. The storyboards can be hand drawn or computer-generated and printed out.

For **Outcome 3** you will use animation tools and techniques to create a 3D computer animation. You will include advanced animation techniques in the animation sequence produced.

You will save the final rendered animation using appropriate formats and available storage devices.