National Unit Specification: general information

UNIT Computer Games: Development (SCQF level 5)

CODE F917 11

SUMMARY

The aim of this Unit is for candidates to gain an understanding of processes involved in the final stages of computer game development. Candidates will learn how to use their chosen game development environment to assemble all the elements and produce a working game. Candidates will acquire an understanding of the evaluation process and then plan and deliver activities to promote a computer game.

OUTCOMES

1 Create a working computer game.
2 Evaluate a computer game.
3 Promote a computer game.

RECOMMENDED ENTRY

While entry is at the discretion of the centre it would be beneficial if candidates had the following IT skills:

D01D 10 *Information Technology (Intermediate 1)*

or equivalent qualifications or experience.

Administrative Information

Superclass: CB

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National Unit Specification: general information (continued)

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CREDIT VALUE

1 credit at Intermediate 2 (6 SCQF credit points at SCQF level 5*).

**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.*

CORE SKILLS

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

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 working computer game.

Performance Criteria

(a) Construct a working game based on the design document and adhering to the game design brief.
(b) Demonstrate an ability to alter the behaviour of objects.
(c) Correctly add media assets as specified in the design document
(d) Devise a test strategy.
(e) Carry out testing to eliminate all major errors, and ensure that the game is playable.

OUTCOME 2

Evaluate a computer game.

Performance Criteria

(a) Accurately evaluate how well the completed game meets the requirements of the game design brief, justifying reasons for evaluation.
(b) Accurately evaluate how well the completed game matches the game design document, clearly justifying any changes from it.
(c) Produce a user review of the game highlighting strengths, describing feasible improvements and applying a rating system.

OUTCOME 3

Promote a computer game.

Performance Criteria

(a) The aims of the promotional activities are clearly described.
(b) Clearly describe two suitable and feasible activities to promote the computer game.
(c) Produce a clear and detailed plan for the activities to promote the computer game.
(d) Carry out the activities in accordance with the plan.
(e) The activities satisfy the stated aims.

National Unit Specification: statement of standards (continued)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

The Evidence Requirements for this Unit will be the production of a portfolio containing the following items:

1 The working computer game.
2 A report which includes one of the following:
- code excerpts
- screenshots of the logic/property mechanisms
- details of the alteration of the behaviour of five objects

3 A list of the media assets that have been added.
4 A test strategy.
5 A record of the test results.
6 A report
- ♦ evaluating how well the completed game meets each requirement of the original game design brief
- ♦ evaluating how well the completed game matches the game design document, justifying any changes

7 A user review of the computer game.
8 A report
- ♦ identifying two suitable and feasible promotional activities for the computer game and stating the aims of the promotional activities
- ♦ containing a clear and detailed plan for the promotional activities

9 Evidence that the promotional activities have been carried out.

National Unit Specification: support notes

UNIT Computer Games: Development (SCQF level 5)

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 is a mandatory Unit in the NPA in Computer Games Development at SCQF level 5. It is included in the optional sections of Digital Media Computing frameworks and can be taken as a standalone Unit.

Outcome 1

If this Unit is part of the NPA in Computer Games Development at SCQF level 5 then the working computer game will be based on the games design document and games design brief used in the Unit *Computer Games: Design.* If taken as a standalone Unit, refer to the Unit code *Computer Games: Design* for information on what tutors should supply in the games design document and games design brief.

Centres should choose games development environments best suited to their local situation. Further information on games development environments is given in Appendix 1.

Candidates should be given the opportunity to develop the skills necessary to work with the chosen games development environment.

The working computer game containing the required media assets will be regarded as evidence that they have been correctly added to the game; the list of media assets may be used as the basis of a checklist. Candidates may use the assets already prepared during the Unit *Computer Games: Media Assets.* If taken as a standalone Unit, tutors should provide the media assets, for example:

- sprites
- sky boxes
- textures (and associated files)
- 3D models
- sound files
- music files
- text files
- video files/animations
- script files

At this level, most of the functionality displayed by the interface must operate correctly, there should be no unfinished areas and the game should play as intended with major graphical, code or other bugs/glitches removed. There should be no areas of the game where players can become ‘stuck’ and not be able to escape to proceed with the level, unless this is part of the game play.

If the game is the product of several candidates then there must also be documentation of the work that each candidate is responsible for producing. The tutor should keep an observation checklist to verify the work of each candidate.

National Unit Specification: support notes (cont)

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The working computer game should be retained in a suitable digital format as part of an e-portfolio.

The tutor should be satisfied that the candidate has used the development environment in an independent manner and has not relied on others for its operation.

Candidates should demonstrate the ability to alter the behaviour of objects in the game. This may be by setting variables or attributes and could, among other ways, be done through code or some graphical means. These settings must alter the games play and not simply, for example, resize an object or change its colour.

The media assets listed as part of the game design document must be incorporated into the game with candidates justifying any omissions or additions.

A report is required in which candidates clearly describe a testing strategy designed to test the functionality of the user interface. In some development environments candidates may have little or no control over the user interface, however this should not prevent candidates from being able to devise and carry out a scheme to fully test it. The test results should then be used to identify any user interface design, game play or control errors encountered under normal use.

A test report is required which clearly records the results of the testing activities identified in the testing strategy.

The reports may be in any of the following forms:

- a hand written or word processed report
- a recorded video
- an audio recording
- a blog

Outcome 2

Candidates should produce a report evaluating

- how well the game meets the requirements of the original game design brief. Each point in the brief should be evaluated and clear reasons given justifying each conclusion. If the game has been produced by a group then each candidate should evaluate the whole game, not just their individual contribution
- how well the completed game matches the game design document, justifying any changes from it

A template for the report could be provided.

Candidates should produce a user review of the completed game and apply a rating system. This review should include suggested improvements to four of the following five design areas: narrative, character, level/environment, gameplay/mechanics and user interface.

National Unit Specification: support notes (cont)

UNIT Computer Games: Development (SCQF level 5)

Narrative Background story — the sequence of events that have led the player to the start of the game. Any relevant or interesting information or history concerning events, characters or the environment. This can provide a setting, eg a sense of place and time, and a reason for the action in the game. The narrative may then continue as the player progresses through the game.

A game, eg an abstract puzzle which may not have a narrative, could be improved by a description of how a player could progress through the game.

Character The usual meaning is for this to refer to the graphic design of player controlled and NPC characters in a game.

Level/environment The design of the level. Are the graphics clearly communicating the required elements (eg mood, place, time etc)? If realism is the aim, does it work? How aesthetically pleasing are the graphics? Is the sound (or other media) effective?

Gameplay/mechanics Can the player access and escape from all areas? Does the game flow well? Are the challenges too easy or difficult?

User Interface Are the controls natural? Do they interfere with playing the game? What is the nature and quality of feedback to the player?

Each design area should receive a rating. There should be a final or overall rating formed from the individual ratings used.

Any mechanism for rating may be used, for example, one to five stars, a percentage, a mark out of 10 and so on. Candidates may decide how the overall rating is formed (highest, average, total and so on). A weighting system may be applied for each of the categories. A reference site is http://www.metacritic.com/games/

Reports and reviews may be in any form however a digital format containing screenshots or other media able to be added to a digital portfolio would be appropriate.

National Unit Specification: support notes (cont)

UNIT Computer Games: Development (SCQF level 5)

Outcome 3

Candidates should describe two suitable and feasible promotional activities for a computer game. The aims of the activities or their constituent parts may be to sell, promote to different audiences or give game help in different areas such as basic operation and rules, hints, problems, upgrades, downloading add-ons, provide technical support or troubleshooting.

It should be possible for the activities identified to be executed electronically, for example:

Website This may be achieved by incorporation of logos, hyperlinks, information text, graphics or other media. The aim of the constituent parts of the website must be clearly stated. Different areas of the web page or website could focus on different aims.

Promotional video trailer or radio advertisement/feature This may contain captured audio or video which has been edited in a computer. This may involve effects, titles, transitions, subtitles, cropping, trimming, sequencing or other forms of editing. If the trailer or advertisement/feature is in sections then the aim of each section should be identified.

Promotional Animated trailer This may take the form of a digital animated trailer which is captured or created. It may be in the form of an animated presentation, a 2D or 3D computer animation or a stop motion animation. This may involve effects, titles, transitions, subtitles, cropping, trimming, sequencing or other form of editing. If the animation is in sections then the aim of each section should be identified.

Magazine article This could incorporate logos, hyperlinks, information text and graphics. The aims of the constituent parts of the article must be clearly stated.

Poster Campaign Different posters or different sections of a poster could focus on different aims.

Product Branding This may incorporate designs for a studio logo, tagline, colour scheme, images, fonts and layout. The branding may be for the studio and/or product. The aims or messages that the branding is trying to impart must be clearly stated.

Product Packaging This could be the design of the box or the cover for the computer game. It could also include designs for associated product media eg CD, DVD or paper guides included with the game. The shape of the container and graphics incorporated, the covers of any booklets could all be designed to impart different messages.

Interactive presentation or multimedia application This may be achieved by incorporation of logos, hyperlinks, information text, graphics or other media.

The report identifying the activities and stating their clear aims relating to the product may be in any of the following forms:

- a hand written or word processed report
- a recorded video
- an audio recording
- a blog

National Unit Specification: support notes (cont)

UNIT Computer Games: Development (SCQF level 5)

Candidates should provide a detailed plan for the promotional activities with the expected outcome of each constituent part. The plan may take one of the following forms:

- Website: Design for the production of a website, consisting of layout templates for pages and navigation map.
- Promotional video trailer: Storyboard, script or layout structure with details of intended impact of each scene.
- Promotional Radio feature: Paragraph plan, script.
- Promotional animated trailer: Storyboard, script or layout structure with details of intended impact of each scene.
- Magazine article: Layout structure — anticipated outcome of each section.
- Poster campaign: List of posters with description and content of each and the message each should deliver.
- Product branding: Sketches, words, colour boards, idea/inspiration boards. The branding should be generic in nature and should not detail specific promotional items. The desired impact of the chosen visual items should be stated.
- Product packaging: Design sketches, nets, text, fonts, colours, images — details of the structure and layout of various items of packaging for the product. The desired impact of each design or items on the design should be stated.
- An interactive presentation or other multimedia application: Storyboard, script of layout structure with details of the intended impact of each element.

Candidates should provide evidence that the activities have been carried out. Some suggestions for the type of evidence to be retained are given below.

Website	digital copy of the website
Promotional Video Trailer	video file
Promotional Radio feature	sound file
Promotional Animated Trailer	video or multimedia file
Magazine Article	digital document
Branding	digital document
Product Packaging	digital document
Presentation	digital copy

National Unit Specification: support notes (cont)

UNIT Computer Games: Development (SCQF level 5)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

If this Unit is undertaken in the context of the NPA in Computer Games Development at SCQF level 5, the following sequence of delivery is recommended:

1 Computer Games: Design
2 Computer Games: Media Assets
3 Computer Games: Development

There are ample opportunities for delivering this Unit in groups and in a vocational context. Candidates could already have formed groups (studios) to design a game and produce media assets for it. It would then be natural for them to all contribute to the development and promotion of the actual game. One approach might be that they each contribute a distinct level of the game. This approach would enable them to evaluate each other's work.

It is essential that each candidate identifies their own contribution to the task if working in a group and that they provide evidence for their own portfolio.

The actual distribution of time between Outcomes is at the discretion of the centre. However, the following distribution and order is suggested.

Outcome 1 24 hours
Outcome 2 6 hours
Outcome 3 10 hours

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In this Unit candidates are required to create a digital game which can provide opportunities to gather evidence towards aspects of *Information and Communication Technology* and *Problem Solving* at SCQF level 5.

The candidate should provide evidence of a promotional activity which could provide opportunities to gather evidence towards aspects of *Communication* at SCQF level 5.

This Unit may be delivered in the context of a larger game with each student in the class developing a level (or logical part) of a digital game. This would provide opportunities to gather evidence towards aspects of *Working with Others* at SCQF level.

National Unit Specification: support notes (cont)

UNIT Computer Games: Development (SCQF level 5)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

A portfolio approach to assessment should be taken. The portfolio may be paper or electronic (digital). The portfolio should be constructed over the period of the Unit, with candidates contributing material to the portfolio on an on-going basis. The contents of the portfolio must be clearly labelled and related to specific evidence requirements. The inclusion of specific items in the candidate's portfolio should be negotiated between the candidate and the assessor; only the 'best' example of the candidate's work should be stored.

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 e-checklists. 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)*.

If an e-portfolio is used to capture candidates' work, it may take one of a variety of forms, ranging from general purpose digital repositories to specialised e-portfolio products. For example, a web log could be used to record candidate activity over the duration of the Unit. Specific entries to the blog could provide sufficient evidence in their own right (for example, a required identification) or could link to a file stored in another web service (such as a file hosting site). The use of a blog would aid authentication since any record of a candidate's day-to-day activities would provide implicit evidence of participation and ownership

If a candidate is undertaking this Unit as part of the NPA in Computer Games Development at SCQF level 5 then the evidence should be retained as part of a portfolio of work required for the Units *Computer Games: Design* and *Computer Games: Media Assets* (SCQF level 5).

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**

APPENDIX 1

There is a vast range of games development environments (GDEs) available. It is up to the centre to choose a GDE that is best suited to their local situation. A task that is trivial to create in one GDE may involve considerable complexity in another. This section tries to categorise these development environments and to give guidance on what would constitute suitable activities/responses for this level.

There are four main categories of games development environment:

1 **General purpose programming tools** are the original games (and everything else) development environments. These are often supplemented with the use of special games oriented libraries of specialised routines, such as OpenGL or DirectX — although these ease aspects of game creation for professionals — they are an extra layer of complication and learning for amateurs. For example C#, Visual Basic, php or Java. This is the most flexible and professionally accepted method and would best prepare candidates for careers in this area. It is also the most technically difficult to master with a steep and long learning curve. The quality of games that can be created depends heavily upon the time available and on the technical expertise of the programmer. Visual design tools are either built into the programming development environment (IDE) or available as separate applications.

2 **Game specific development environments** are designed for enthusiastic amateurs. This category probably has the widest coverage from in-game editors, stand alone level editors and special graphical games development environments, some can even be downloaded from xbox live to run on an xbox 360 (for example). These are often extensible through scripting of varying complexities, while easing the creation of a game by utilising a professionally created game engine. The quality of games created can easily reach professional quality.

3 **Multimedia development environments**, through their own evolution, have developed enough flexibility and capability to be able to author complete games. The boundaries between some of these and some games development environments are blurring, for example Flash, a multimedia development tool, is capable of producing higher quality games than some of the lower-end specialist games development environments. The main difference is that games development environments already have defined games engines (with rendering, collision detection, games rules and so on available or built in) whereas multimedia development environments will certainly have animation routines/capabilities and interactive capabilities but will be lacking specialised games capabilities. As in #1 the quality of games developed depends on the time available and on the technical expertise of the programmer — although the technical knowledge is perhaps less demanding than by using a general purpose programming environment.

4 **Educational games development environments**. These are aimed for children and although the quality of the games produced is the lowest of all the methods mentioned here, it takes much less effort to produce a playable game than if using a general purpose programming tool. These are suitable for introducing programming concepts in a motivating environment where candidates can see immediate rewards.

Notes on the expected results from using each of these types of GDE:

1 General purpose programming tools
If a general purpose environment is selected candidates should have already developed programming skills.

It is expected that the complexity of games produced at this level will be basic but the game's visual appearance and/or game play and/or interface will be more advanced than that evident at level 4. For example, the game's scoring system may be more sophisticated, perhaps rating a player's score in comparison to other players.

2 Game specific development environments
This is the widest single category here. In many of these environments code and scripting (or scripting mechanisms) are hidden from the developer. Tutors are encouraged to make candidates aware of game logic control mechanisms and, if possible, allow some experimentation with it. The game play and game mechanics are usually only accessible through scripting (if at all).

Importing media assets into these environments is likely to cause the most issues. Sometimes the media is created and/or edited directly within these environments.

The types of games designed for these environments will, in most cases, be restricted to the type of game most easily offered by the built-in game engine. The final game is likely to be much more complex than those created using general purpose programming tools, but the actual design of the games does not have to be overly complex. For example, if using a level editor for a 3D first-person game then a complete and playable level should be expected that is free of bugs (for example inescapable locations) and has all the required media assets (eg textures or 3D objects) in place. The size of this example level need not be restricted to two or three locations/rooms but will depend on the amount of detail, for example a single large area with a large amount of detail may be more acceptable than four plain rooms with hardly any detail in them. The locations should be well finished and match the design/brief but this should be balanced against the number of locations and overall complexity of the level.

3 Multimedia development environments
As with general purpose programming tools the response of candidates using this particular GDE will depend on their ability to manipulate the code. In some developments, like Flash, inserting the code can be tricky for candidates at this level as it is applied to individual objects, although this can be seen as similar to the way Scratch uses the blocks of code. When creating games these environments can be the most complex of all those featured here. The methods for defining the behaviour of objects will depend on the development environment and may be through the setting of attributes in the graphical designer screen or through the setting of variables in the code. The exact method used will depend on how the game has been designed and on the specific development environment.

4 Educational games development environments
These are generally designed to be accessible to candidates. Candidates are expected to demonstrate a clear grasp of the program code. As in previous development environments the exact methods used to control the behaviour of objects will depend on the specifics of the development environment. To match the level of games produced in other GDEs the games might have to be more complex — although this can be balanced by how much control a candidate has had over the logic of the game (ie the code).