Higher National Unit Specification

General information for centres

Unit title: Multimedia: Developing Multimedia Applications

Unit code: DH2R 34

Unit purpose: This Unit is designed to provide candidates with a broad knowledge of the theoretical concepts, principles, boundaries and scope of the development of multimedia applications. The Unit adopts a structured approach to the development process from analysis of the problem and research of user needs, through design, prototyping, implementation, testing and evaluation to ensure that the selection and deployment of media types matches the task requirements, context of use and user requirements. It prepares candidates for this role by providing them with the underpinning knowledge needed to carry out this type of development effectively. Current terminology is introduced as appropriate. The Unit is primarily intended for candidates in computing or graphic design. It would also be relevant to those with appropriate work experience such as the use of desktop publishing or computer graphics packages.

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

1. Identify and document task and user requirements and context of use
2. Produce a design and specification and build a prototype multimedia application
3. Implement a multimedia application based on a design specification
4. Test and evaluate a multimedia application and revise as required

Credit points and level: 2 HN credits at SCQF level 7: (16 SCQF credit points at SCQF level 7*).

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 will be at the discretion of the Centre. There are no specific requirements, however it would be beneficial if candidates had some general communication and practical computing skills such as might be demonstrated by the achievement of core skills Units in Communication and Using Information Technology at Intermediate 2. However, it is expected that a candidate is either studying this unit in conjunction with or following the completion of the HN Unit DH35 34 *Computing: Planning*.

General information for centres (cont)

Core skills: This Unit gives automatic certification of Problem Solving at Higher.

Context for delivery: This Unit is included in the framework of a number of HNC and HND group awards. It is recommended that it should be taught and assessed within the context of the particular group award to which it contributes.

Assessment: The Unit must be assessed by means of a single project covering all four Outcomes. The achievement requirements are inherent in the evidence requirements.

All outcomes are open book.

Assessors must assure themselves of the authenticity of each candidate's submission.

Some of the evidence requirements may be produced using e-assessment. This may take the form of e-testing (for knowledge and understanding) and/or e-portfolios (for practical abilities). There is no requirement for you to seek prior approval if you wish to use e-assessment for either of these purposes so long as the normal standards for validity and reliability are observed. Please see the following SQA publications for further information on e-assessment: (1) "SQA Guidelines on Online Assessment for Further Education" (March 2003) and (2) "Assessment & Quality Assurance in Open & Distance Learning" (Feb. 2001).

Higher National Unit specification: statement of standards

Unit title: Multimedia: Developing Multimedia Applications

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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

Identify and document task and user requirements and context of use

Knowledge and/or skills

♦ Identifying client requirements
♦ Identifying user requirements
♦ Identifying context of use
♦ Identifying hardware and software requirements
♦ Research skills

Evidence requirements

Each candidate will be required to produce evidence to show that s/he can, with reference to the information supplied, develop documentation to meet a given problem specification. The multimedia application user requirements documentation will consist of the following:

♦ Investigation of why the client needs the multimedia application and what they expect it to achieve
♦ Investigation of user requirements for the multimedia application
♦ Identification of the context in which the application will be used
♦ Identification of the hardware and software required to develop and run the application
♦ An outline of the task(s) which the multimedia application is to perform
♦ A description of the proposed features to be available to the user

Evidence will take the form of a report, ie the User Requirements Specification document, which must include identification of users, a description of user needs, delivery medium, purpose and likely location of the package and identify the appropriate hardware and software.

On completion of this outcome, assessors must sign and date the documentation to assure themselves of the authenticity of each candidate's submission.

Higher National Unit specification: statement of standards (cont)

Unit title: Multimedia: Developing Multimedia Applications

The assessment of this Outcome will be the production of a User Specification Document by the candidate appropriate to a scenario supplied by the assessor or based on a real-time case study. This assessment is open book.

Assessment guidelines

The assessment of this Outcome will be the production of a User Specification Document by the candidate to a scenario supplied by the assessor or based on a real-time case study. This assessment is open book.

Outcome 2

Produce a design and specification and build a prototype multimedia application

Knowledge and/or skills

♦ Information components of the application
♦ Production of a design specification
♦ Navigational techniques
♦ Prototyping the application
♦ Testing the prototype

Evidence Requirements

Evidence for the knowledge and/or skills in this Outcome will be the production of a Design Specification with a candidate building the application prototype. Each candidate will need evidence to show that s/he can, with reference to a particular problem description (ie their User Requirements Specification Document produced for Outcome 1), identify information components, produce a design specification which shows the overall structure of the application, specify navigational techniques used to access information components and prototype and test the application. This will involve problem solving, analysis and synthesis. The evidence should be derived from a case study scenario or workplace task, which covers all of the following six items. The evidence should be consistent and should accurately:

♦ Identify the information components that make up the application (Information components must be listed with a brief description of each)
♦ Include a design specification that shows the overall structure of the application
♦ Specify the navigational techniques used to access the information components
♦ Include a working application prototype
♦ Describe methods of testing of the prototype
♦ Demonstrate revision of the design if necessary

The Design Specification should be presented with text and appropriate graphical techniques, eg using structure charts and/or storyboards (one page overview, plus one page for each major subsection).

Higher National Unit specification: statement of standards (cont)

Unit title: Multimedia: Developing Multimedia Applications

The Application Prototype must consist of: an introductory screen, main menu interface (and sub-menus where appropriate), sample feedback or information screens, a finishing screen and appropriate navigational links.

A brief report on testing the prototype should indicate what tests (including screen dumps where possible/appropriate) were carried out and the results achieved. This report should also include details of any revisions to the prototype implemented as a result of testing.

This assessment is open book.

Assessors must assure themselves of the authenticity of each candidate's submission.

Outcome 3

Implement a multimedia application based on a design specification

Knowledge and/or skills

- ♦ Appropriate text, graphic, audio and video elements
- ♦ Acquire the identified media elements in accordance with relevant legislation
- ♦ Import and manipulate media elements
- ♦ Determination and setting of interface object properties
- ♦ Handle keyboard and mouse events

Evidence requirements

Evidence for the knowledge and/or skills in this Outcome will be presented as part of a final report which will be included with Outcome 4. Each candidate will need evidence to show that s/he can, with reference to a particular problem (User Specification (ie Outcome 1) and the Design Document (ie Outcome 2)), identify the text, graphic, audio and video elements to be used to present each information component, acquire the relevant media elements, import and manipulate media elements, determine and set interface object properties and handle keyboard and mouse events. The evidence should be consistent and should accurately:

- ♦ Identify the text, graphic, audio and video elements to be used to present each information component
- ♦ Demonstrate that the identified media elements have been acquired in accordance with relevant legislation
- ♦ Show how media elements are imported and manipulated
- ♦ Describe how interface object properties are determined and set
- ♦ Describe the handling of keyboard and mouse events

Higher National Unit specification: statement of standards (cont)

Unit title: Multimedia: Developing Multimedia Applications

The elements should be detailed for each information component listing type, source, import and manipulation details and any relevant legal requirements. The candidate should describe the determination and setting of interface object properties and the handling of keyboard and mouse events.

This assessment is open book.

Assessors must assure themselves of the authenticity of each candidate's submission.

Assessment guidelines

The assessment of this Outcome could be combined with Outcome 4.

Outcome 4

Test and evaluate a multimedia application and revise as required

Knowledge and/or skills

♦ Select an appropriate test strategy
♦ Ensure that the application operates as specified
♦ Check the usability of the application
♦ Evaluate the extent to which the application meets client and user requirements
♦ Revise the application as required

Evidence requirements

Evidence for the knowledge and/or skills in this Outcome should be presented as part of a report with evidence presented in appendices (eg screen dumps). Each candidate will need evidence to show that s/he can, with reference to the items produced in the previous unit Outcomes, select an appropriate test strategy, ensure that the application operates as specified, check the usability of the application, evaluate the extent to which the application meets client and user requirements, revise the application as required.

The evidence, which a candidate must produce, is a test strategy, a test plan and a test log.

  This assessment is open book.

Assessors must assure themselves of the authenticity of each candidate's submission.

Assessment Guidelines

It is recommended that the assessment of this Outcome should be combined with Outcome 3.

Administrative Information

Unit code: DH2R 34

Unit title: Multimedia: Developing Multimedia Applications

Superclass category: CE

Date of publication: November 2004

Version No: 2

Source: SQA

Higher National Unit specification: support notes

Unit title: Multimedia: Developing Multimedia Applications

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 primarily intended to prepare candidates to undertake the development of multimedia applications. The Unit adopts a structured approach to the development process from analysis of the problem through design, prototyping and implementation to ensure that the selection and deployment of media types matches task requirements, context of use and user requirements. It prepares candidates for this role by providing them with the underpinning knowledge needed to carry out this type of development effectively. It is primarily intended for candidates in computing or graphic design. It would also be relevant to those with appropriate work experience such as the use of desktop publishing or computer graphics packages. Candidates will be expected to exercise a significant degree of autonomy in carrying out the tasks required for the Unit.

There is no prescription regarding hardware and software facilities. However, the relevant facilities should be available to the candidate throughout the duration of the Unit. In some instances, candidates may decide to create media elements themselves, eg by creating graphics with a drawing package, recording and digitising video, recording sound, or taking still photographs with a digital camera. Although these activities could enrich the learning process, they are not directly assessable as part of the Unit. Candidates may also gain significant skills in the use of application packages, such as image editors, but again, these are not directly assessable.   Where a candidate sources items to be included in their development, these must be acknowledged. Where possible permission should be sought from copyright holders.

Outcome 1

This will consist of investigating client and user requirements and identifying the context of use. The client is the individual or organisation who put forward the proposal for the application. The users are those who will make use of the final product. The context of use would include the users, delivery medium, purpose and likely location of the package, eg:

♦ A basic numeracy package at SQA Intermediate 1 level, delivered on CD-ROM. The package is designed for use by schoolchildren in the classroom or for revision at home, but it may also be of use to adults who wish to improve their numeracy skills at home, at work or in libraries or study centres.

♦ A home shopping application for electronic goods, delivered via the Internet for the use of adults who wish to compare products and select purchases from home and make payment via secure credit card transaction.

Higher National Unit specification: support notes (cont)

Unit title: Multimedia: Developing Multimedia Applications

Hardware and software facilities include those required to develop the application and those required to run it. Candidates will be required to be familiar with the processes of research in order to investigate task and user requirements.

Outcome 2

The information components are the subsections into which the application is divided. Each will normally relate to some topic and could have several (ie two or more) media elements associated with it, eg text, photographs, sound, etc.

The design specification may be presented in graphical form, eg using structure charts and/or storyboards and should show the overall structure of the application and the navigational techniques used to access information components. The application prototype must be a skeleton application consisting of at least: an introductory screen, main menu interface (and sub-menus (where appropriate), sample feedback or information screens, a finishing screen and appropriate navigational links. It should show all the major navigational elements of the system and give an indication of the content at each level. Candidates should be encouraged to use their creative skills in designing and prototyping the application.

The prototype must be thoroughly tested, as it will provide the navigational model for the final application. Testing should be carried out systematically, eg using a depth-first or breadth-first strategy, to ensure that all possible navigational routes are checked. The prototype should be revised to correct any errors or deficiencies uncovered during testing.

Outcome 3

Candidates should be encouraged to present information by using a variety of media elements, including text graphics (drawings, diagrams and photographs) audio (sampled or midi) and video. **Meticulous attention should be paid to the copyright status of media elements.** Candidates should be encouraged to generate their own media elements or make use of public domain or licensed resources, such as clip-art collections. Where this is not possible, permission should be sought from copyright holders. As this can be a time-consuming process, it should be done as early in the Unit as possible.

In many cases media elements will require to be imported, eg by digitising video or sampling sound. Media elements may also require manipulation, eg resizing or cropping of images, compression of sound files etc. Candidates will need to know how to determine and set the properties of interface objects, such as buttons and handle simple keyboard and mouse events (eg press of alpha, numeric or function keys, left and right mouse clicks, mouse movement).

Outcome 4

Each candidate will need evidence to show that s/he can, with reference to a particular proposal, select an appropriate test strategy, ensure that the application operates as specified, check the usability of the application, evaluate the extent to which the application meets client and user requirements, revise the application as required.

Higher National Unit specification: support notes (cont)

Unit title: Multimedia: Developing Multimedia Applications

Testing will provide an opportunity for candidates to demonstrate their skills in solving non-routine problems.   Possible strategies would include top-down testing, starting with a skeleton which includes the main navigational paths and gradually adding additional components, testing each as it is added, or bottom-up testing, constructing and testing components in isolation then bringing them together to create the final product.

Evaluation is an important component of this Outcome and should include an assessment of the extent to which the objectives of the product have been achieved, along with suggestions for further development or future enhancement.

Guidance on the delivery and assessment of this Unit

This Unit is likely to form part of a group award that is primarily designed to provide candidates with technical or professional knowledge and skills related to the development of multimedia applications.   The Unit is highly practical in nature, so formal delivery should be kept to a minimum, with candidates being encouraged to gain as much practical experience as possible and explore the features of hardware and software.

The assessment activities should happen naturally as a candidate progresses through the steps that have to be undertaken.   Candidates who are in employment may be able to identify a suitable project at work, eg an electronic brochure for one of their employer's products, or a training package for a new business or procedure.   Other candidates may wish to produce a web site or CD-ROM relating to a hobby, a biography or fanzine for a media personality or a product devoted to a sports club.

However, in some circumstances it may be appropriate to use shorter stand-alone assessments for each Outcome. Assessments of this nature could also be used for reassessment purposes.

Open learning

If this Unit is delivered by open or distance learning methods, additional planning and resources may be required for candidate support, assessment and quality assurance.   A combination of new and traditional authentication tools may have to be devised for assessment and re-assessment purposes.   For further information and advice, please see *Assessment and Quality Assurance for Open and Distance Learning* (SQA, February 2001 — publication code A1030).

Candidates with additional support needs

This Unit specification is intended to ensure that there are no artificial barriers to learning or assessment.   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.   For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements for Candidates with Additional Support Needs* (BA 2399, SQA, due 2004).

General information for candidates

Unit title: Multimedia: Developing Multimedia Applications

The Unit is about the skills and techniques required to undertake the development of multimedia systems. It has four main areas, each of which is the subject of a separate Outcome. To begin with you will analyse a problem description to identify task and user requirements and context of use. You will then specify the information needs and interaction requirements for a multimedia application. Following this you will design and prototype the overall structure of the application and the navigation techniques used to access information components. You will then obtain the media elements used to present each information component. After this you will implement a multimedia application based on a design specification. Finally, you will test and evaluate a multimedia application, revise and amend system as required.

Overall, you will be expected to use the knowledge and skills from the Unit to enable you to develop multimedia applications.

Assessment will be by means of a single project which is developed as you work though the activities with this covering all the outcomes.