Higher National Unit Specification

General information for centres

Unit title: Multimedia Computing: Audio and Video 2

Unit code: DF67 35

Unit purpose: This Unit is designed to enable candidates to work with audio and video in a multimedia and web development role. The Unit should provide candidates with a greater understanding of the theoretical principles and practices involved in producing quality output. The Unit prepares candidates for this role by building on the knowledge and skills gained in the HN Unit Multimedia Computing: Audio and Video 1. Candidates should gain practical experience in investigating and applying the audio and video techniques utilised in industry to produce quality media files for inclusion in multimedia and web applications. The Unit places strong emphasis on the practical application of standard practices used in the production of audio and video for multimedia and web applications. The Unit may also be relevant to candidates studying on other Computing/Information Technology programmes who may wish to enhance their knowledge and skills to include a practical understanding of the use of audio and video in the world of Information Technology.

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

1. Describe the principles involved in producing quality audio recordings and the problems typically encountered due to environmental influences.
2. Describe the principles involved in producing quality video recordings and the problems typically encountered due to environmental influences.
3. Describe and compare file compression techniques for audio and video files.
4. Produce a sequence of audio and video files to meet a specific multimedia application brief.

Credit value: 2 HN Credits at SCQF level 8: (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. Although differing programmes of study will be sufficient to prepare candidates for this Unit it is recommended that they should have successfully completed the HN Unit Multimedia Computing: Audio and Video 1. If candidates have not completed HN Unit Multimedia Computing: Audio and Video 1 then they should have an understanding of audio and video gained either through prior study or through work experience. This may be evidenced by the possession of relevant National Units, HN Units or experience.

General information for centres (cont)

Core skills: There may be opportunities to gather evidence towards core skills 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: This Unit should be assessed in such a manner that the candidate has the opportunity to demonstrate both theoretical and practical skills. Where theoretical aspects are being assessed a combination of short and extended responses should be considered. Where practical skills or the practical application of principles are being assessed then candidates should be presented with realistic exercises and/or assignments.

Higher National Unit specification: statement of standards

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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

Describe the principles involved in producing quality audio recordings and the problems typically encountered due to environmental influences.

Knowledge and/or skills

- Properties of sound that are relevant to multimedia computing applications
- Environmental influences relevant to sound recording for multimedia computing applications.
- Problems typically encountered in recording sound and the techniques used to overcome these.

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can:

- Identify the properties of sound relevant to multimedia computing applications. This must include at least:
  o Frequency, amplitude, harmonics, pitch and timbre

- Identify the environmental influences relevant to sound recording for multimedia computing applications. This must include at least:
  o Reflection, absorption, resonance and acoustics

- Identify the problems typically encountered in recording sound and the techniques used to overcome these. This must include at least:
  o Wind, echoes and background noises such as conversation, traffic and so forth.
  o Microphone selection and use of wind barriers as possible solutions to problems.

This part of the assessment for Outcome 1 will be in the form of 20 short response questions. Each of the knowledge and/or skills must be covered in the assessment and the questions allocated on an equal basis. The assessment must be carried out in a supervised environment,

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Higher National Unit specification: statement of standards (cont)

Unit title: Multimedia Computing: Audio and Video 2

will be closed book and is to be completed in no more than 1.5 hours. Candidates must answer 12 out of the 20 questions (60%) correctly in order to obtain a pass in this part of Outcome 1.

- Produce a report of approximately 500 words on an investigation carried out in a selection of locations (at least 3) offering different audio recording challenges. The report must be supported by a number of audio recordings (at least 3) sufficient to support the findings. The report must show evidence of the problems typically encountered in recording audio, eg wind, echoes and background noises, and the techniques used to overcome these problems, eg wind barriers.

Assessment guidelines

This outcome is designed to enable candidates to demonstrate that they have acquired the background theoretical knowledge relevant to the practical skills inherent in the unit. Emphasis should be placed on the candidate's investigative/research development with tutors presenting a set of briefs related to possible recording problems. It is strongly recommended that candidates are encouraged to demonstrate an analytical approach to the challenges and their solution when operating at this level.

Outcome 2

Describe the principles involved in producing quality video recordings and the problems typically encountered due to environmental influences.

Knowledge and/or skills

- Principles of camera skills
- Principles of lighting for video
- Principles of video editing

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can:

- Identify the principles involved in the production of camera skills. This must include at least:
  - Composition, shot sizes, camera angles, framing, perspective and camera movements.

- Identify the principles involved in lighting for video. This must include at least:
  - Natural light, white balance, use of additional lighting and use of colour and special effects filters

Unit title: Multimedia Computing: Audio and Video 2

- Identify the principles involved in video editing. This must include at least:
  - In-camera editing, jump cuts, line of action, sight lines, cutaways, cutting on action and parallel action.

This part of the assessment for Outcome 2 will be in the form of 20 short response questions. Each of the knowledge and/or skills must be covered in the assessment and the questions allocated on an equal basis. The assessment must be carried out in a supervised environment, will be closed book and is to be completed in no more than one and a half hours. Candidates must answer 12 out of the 20 questions (60%) correctly in order to obtain a pass in this part of Outcome 2.

- Produce a report of approximately 500 words on an investigation carried out in a selection of locations (at least 3) offering different video recording challenges. The report must be supported by a number of video recordings (at least 3) sufficient to support the findings. The report must show evidence of the practical application of the principles of recording video as stated above.

Assessment guidelines

Candidates should be set a series of practical tasks that allow him/her to investigate how the principles involved in producing quality video recordings are used in practice. Emphasis should be placed on the candidate's investigative/research development with tutors presenting a set of briefs related to possible video recording situations. It is strongly recommended that candidates are encouraged to demonstrate an analytical approach to the challenges and their solution when operating at this level.

Outcome 3

Describe and compare file compression techniques for audio and video files.

Knowledge and/or skills

- Compression techniques currently used in digital audio files for multimedia computing applications
- Compression techniques currently used in digital video files for multimedia computing applications

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can:

- Briefly describe the techniques of industry standard compression techniques including:
  - Lossless, lossy, simple, interpolative, predictive, statistical, fractal, compression/de-compression balance and streaming.

Higher National Unit specification: statement of standards (cont)

Unit title: Multimedia Computing: Audio and Video 2

This part of the assessment for Outcome 3 will be in the form of 10 short response questions. Each of the knowledge and/or skills must be covered in the assessment and the questions allocated on an equal basis. The assessment must be carried out in a supervised environment, will be closed book and is to be completed in no more than one hour. Candidates must answer 6 out of the 10 questions (60%) correctly in order to obtain a pass in this part of Outcome 3.

- Produce a report of approximately 250 words on an investigation carried out on the compression of audio recordings using different (at least 3) industry standard compression methods. The report must be supported by a number of audio recordings sufficient to support the findings. The report must show the file sizes of the original uncompressed file and the file sizes after compression together with comments on the quality and usability of the final version for multimedia applications given at a level commensurate with the academic and vocational level of the Unit.

- Produce a report of approximately 250 words on an investigation carried out on the compression of video recordings using different (at least 3) industry standard compression methods. The report must be supported by a number of video recordings sufficient to support the findings. The report must show the file sizes of the original uncompressed file and the file sizes after compression together with comments on the quality and usability of the final version for multimedia applications given at a level commensurate with the academic and vocational level of the Unit.

Assessment guidelines

Candidates should be given the opportunity to investigate the subject matter in this Outcome using guided resource based learning. At the time of writing many sources of suitable material have been identified (eg the Internet). It is envisaged that this outcome should provide the candidate with the opportunity to develop investigating/research skills relevant to the multimedia computing industry. It is strongly recommended that candidates are encouraged to demonstrate an analytical approach to the challenges and their solution when operating at this level.

Outcome 4

Produce a sequence of audio and video files to meet a specific multimedia application brief.

Knowledge and/or skills

- Identify necessary media content
- Plan and record audio content
- Plan and record video content
- Produce a multimedia application or web site to match the given brief.

Higher National Unit specification: statement of standards (cont)

Unit title: Multimedia Computing: Audio and Video 2

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can:

- Produce a portfolio of evidence which must include:
    - The original brief
    - A description of the proposed content and a justification of how it meets the brief
    - A recording plan for the necessary audio files together with the actual files and a justification for the file-types used
    - A recording plan for the necessary video files together with the actual files and a justification for the file-types used
    - A construction plan for the application or website together with the relevant application and/or web-site files.
- The portfolio must be formally presented in a logical order and include all of the relevant files stored on a suitable medium.

Assessment guidelines

The candidate should be given a brief that requires audio and video content to be recorded to suit the brief. Candidates could be encouraged to submit a brief related to some area of personal interest. However, tutor guidance should be given sufficient to ensure that the brief is substantial enough to give a suitable challenge for this academic level. It is strongly recommended that candidates are encouraged to demonstrate a professional approach to the work and final presentation required in this Outcome commensurate with the academic and vocational level of the Unit.

Administrative Information

Unit code: DF67 35

Unit title: Multimedia Computing: Audio and Video 2

Superclass category: CE

Date of publication: November 2003

Version: 01

Source: SQA

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. The cost for each Unit specification is £2.50. (A handling charge of £1.95 will apply to all orders for priced items.)

Higher National Unit specification: support notes

Unit title: Multimedia Computing: Audio and Video 2

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

Outcome 1

Properties of sound include frequency, amplitude, harmonics, pitch and timbre. Environmental influences include reflection, absorption, resonance and acoustics. Typically, sound recordings are influenced by wind, echoes and background noises such as conversation, traffic etc. Candidates should be encouraged to consider microphone selection and use of wind barriers as possible solutions to problems. It should be borne in mind that the candidate is not expected to demonstrate the skills of a fully skilled sound recordist but to demonstrate an awareness of problems typically encountered when recording sound.

Outcome 2

Principles of camera skills include: composition, shot sizes, camera angles, framing, perspective and camera movements.

Principles of lighting skills include the use of natural light, white balance, use of additional lighting and use of colour and special effects filters. It is not considered necessary for the centre to provide fully equipped studios or lighting sets providing the candidate can demonstrate a knowledge of industry used set-ups.

Principles of editing include in-camera editing, jump cuts, line of action, sight lines, cutaways, cutting on action, parallel action etc.. Again, it should be borne in mind that the candidate is not expected to demonstrate the skills of a fully skilled camera person but to demonstrate an awareness of techniques typically employed when recording video.

Outcome 3

Compression techniques introduced in the outcome should reflect the principles of current industry algorithms. At the time of writing a sample set of these would include lossy/lossless, simple, interpolative, predictive, statistical, fractal, compression/de-compression balance and streaming. It is envisaged that candidates could be encouraged to use available CODECS to compress files to compare the playback quality produced.

Higher National Unit specification: support notes (cont)

Unit title: Multimedia Computing: Audio and Video 2

Outcome 4

Many excellent examples exist of applications which include both audio and video sequences to enhance the information interchange. At the time of writing The BBC Learning Zone offers on-line language tuition courses in various non-English languages. Various encyclopaedia CD-ROMs are available. Both of these are examples that demonstrate appropriate inclusion of media files. Candidates should be encouraged to be able to justify the inclusion of media rather that simply including it because they know how to.

Guidance on the delivery and assessment of this Unit

This unit should provide candidates with opportunities to develop and display the research, analytical and job tenacity skills that should be expected of a person operating at this level in a multimedia and/or web development role. The theoretical aspects are well covered in a range of suitable books, websites and other publications to which candidates can be guided for research based learning whilst the practical aspects can be delivered and assessed through a series of well-planned exercises/assignments. An emphasis should be placed on the practical application of the theory with candidates being encouraged to see and accept the benefits of this rather than see the two in isolation. Candidates should be encouraged to undertake written work with due regard to the level of communication expected at this level of education/training.

Outcome 1 will be assessed in two parts. The first part will be by 20 short-response questions testing candidates' knowledge and skills on the properties of sound, the environmental influences and the problems involved in producing audio recordings. In the second part of Outcome 1 candidates will be asked to produce a report of approximately 500 words on a practical investigation carried out in a selection of locations offering different audio recording challenges.

Outcome 2 will also be assessed in two parts. The first part will be by 20 short-response questions testing candidates' knowledge and skills on the principles involved in producing quality video recordings and the problems involved in producing video recordings. In the second part of Outcome 1 candidates will be asked to produce a report of approximately 500 words on a practical investigation carried out in a selection of locations offering different video recording challenges.

In Outcome 3 candidates will be assessed on their knowledge and/or skills in relation to compression techniques. The assessment will be in two parts, the first will be by 10 short-response questions and the second by the production of two reports of 250 words each. Candidates will need to achieve a minimum of 60% of the available marks to obtain a pass in Outcomes 1, 2 and 3.

Higher National Unit specification: support notes (cont)

Unit title: Multimedia Computing: Audio and Video 2

For Outcome 4 candidates will be asked to produce a portfolio of written and practical work to demonstrate their knowledge and/or skills in producing a sequence of audio and video files to meet a specific multimedia application brief.

Open learning

This unit could be delivered by distance learning. However, it would require planning by the centre to ensure the sufficiency and authenticity of candidate evidence. The assessment arrangements outlined above should be suitable for open learning provided regular contact can be maintained with the tutor.

For information on normal open learning arrangements, please refer to the SQA guide *Assessment and Quality Assurance of Open and Distance Learning* (SQA, 2000).

Special needs

This Unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering special alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, 2001).

General information for candidates

Unit title: Multimedia Computing: Audio and Video 2

This Unit is designed to enable you to work with audio and video in a multimedia and web development role. You should gain practical experience in investigating and applying the audio and video techniques utilised in industry to produce quality media files for inclusion in multimedia and web applications.

On completion of the Unit you should be able to:

1.   Describe the principles involved in producing quality audio recordings and the problems typically encountered due to environmental influences.
2.   Describe the principles involved in producing quality video recordings and the problems typically encountered due to environmental influences.
3.   Describe and compare file compression techniques for audio and video files.
4.   Produce a sequence of audio and video files to meet a specific multimedia application brief.

In Outcome 1 you should learn about the properties of sound including frequency, amplitude, harmonics, pitch and timbre. You will also learn about the environmental influences involved in producing audio recordings such as reflection, absorption, resonance and acoustics. You should find out how to deal with, for example, the problems associated with echoes, wind and background noises such as conversation and traffic by using appropriate forms of microphone selection. You should be given practice in and learn how to use audio equipment to produce high quality audio recordings. In the first part of Outcome 1 you will be assessed by 20 short-response questions testing your knowledge and skills on the properties of sound, the environmental influences and the problems involved in producing audio recordings. You will need to answer 12 questions correctly (i.e. obtain 60%) in order to achieve a pass in this part of Outcome 1. In the second part of Outcome 1 you will be asked to produce a report of approximately 500 words on a practical investigation carried out in a selection of locations offering different audio recording challenges. Your report will be supported by a number of audio recordings which will support the findings of your investigation.

In Outcome 2 you should learn about the principles of camera skills including: composition, shot sizes, camera angles, framing, perspective and camera movements. You should also find out about the principles of lighting, including the use of natural light, white balance, additional lighting, colour and special effects filters.   You should also learn about the principles of editing, including, for example, in-camera editing, jump cuts, line of action, sight lines, cutaways, cutting on action and parallel action. You should be given practice in and learn how to use audio equipment to produce high quality video recordings. In the first part of Outcome 2 you will be assessed by 20 multiple-choice or short-response questions testing your knowledge and skills on the principles involved in producing high quality video recordings. You will need to answer 12 questions correctly (i.e. obtain 60%) in order to achieve a pass in this part of Outcome 1. In the second part of Outcome 1 you will be asked to produce a report of approximately 500 words on a practical investigation carried out in a selection of locations offering different video recording challenges.

General information for candidates (cont)

Unit title: Multimedia Computing: Audio and Video 2

Your report will be supported by a number of video recordings which will support the findings of your investigation.

Outcome 3 introduces you to the topic of the compression techniques that may used in industry for audio and video recording. You should learn about the theory of compression techniques such as: lossy/lossless, simple, interpolative, predictive, statistical, fractal, compression/de-compression balance and streaming. You should also be given practice in and learn how to use various compression techniques with audio and video files.
In the first part of Outcome 3 you will be assessed by 10 short-response questions testing your knowledge and skills on compression techniques. You will need to answer 6 questions correctly (i.e. obtain 60%) in order to achieve a pass in this part of Outcome 3. In the second part of Outcome 3 you will be asked to produce two reports of approximately 250 words each on practical investigations into audio and video compression techniques respectively.

In Outcome 4 you should put your knowledge and skills to good practical use and produce a sequence of audio and video files to meet a specific multimedia application brief. You should learn how to identify media content, plan and record audio and video content and to produce a multimedia application or web site to match a given brief. You will be assessed on Outcome 4 by being asked to produce a portfolio of written work to show that you can identify the required media content and carry out the analysis and planning stages involved in recording audio and video content which is suitable for your multimedia application or web site. You will need to produce the portfolio in accordance with the specifications set out in a given brief in order to achieve a pass in Outcome 4.