National Unit Specification: general information

UNIT Multimedia Technology (Intermediate 2)

NUMBER DF32 11

COURSE Computing (Intermediate 2)

SUMMARY

This Unit is designed to develop knowledge and understanding of the principles of multimedia technology and to develop practical skills in the capture, creation and storage of multimedia data through the use of contemporary hardware and software. This knowledge and understanding and these practical skills may then be applied by the candidate to solve practical problems in the context of multimedia applications. It is designed as an option for candidates undertaking the Intermediate 2 Computing Course, but is also suitable for anyone wishing to develop a basic understanding of multimedia technology.

OUTCOMES

1. Demonstrate knowledge and understanding of the principles, features, purposes and implications of the technologies involved in the capture, creation and storage of multimedia data by contemporary multimedia systems.
2. Demonstrate practical skills in the use of multimedia technology using contemporary hardware and software.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following or equivalent.

- Intermediate 1 Computing Studies
- Intermediate 1 Multimedia Applications Unit
- Standard Grade Computing at General level

Administrative Information

Superclass: CE

Publication date: April 2004

Source: Scottish Qualifications Authority

Version: 01

National Unit Specification: general information (cont)

UNIT Multimedia Technology (Intermediate 2)

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

National Unit Specification: statement of standards

UNIT Multimedia: Technology (Intermediate 2)

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 the Scottish Qualifications Authority.

OUTCOME 1

Demonstrate knowledge and understanding of the principles, features, purposes and implications of the technologies involved in the capture, creation and storage of multimedia data by contemporary multimedia systems.

Performance Criteria

a) Basic computing terminology is used appropriately.
b) Simple descriptions and explanations are related to practical and familiar contexts.
c) Simple conclusions, predictions and generalisations are made from knowledge and understanding.

Evidence Requirements

Written or oral evidence that the candidate can describe and explain the principles, features and purposes of multimedia technology. Evidence should be obtained using questions in a closed book test, under supervision, lasting no more than 45 minutes. The test must sample content (see Computing (Intermediate 2) Course content) within the following areas:

- development process for multimedia applications
- bit-mapped graphic data
- digitised sound data
- video data
- vector graphics data
- synthesised sound data
- implications of the use of contemporary multimedia technology

(The content statements are also reproduced for convenience as a table in the support notes for this Unit).

The standard to be applied is illustrated in the National Assessment Bank items available for this Unit. If a centre wishes to design its own assessments for this Unit, they should be of a comparable standard.

National Unit Specification: statement of standards (cont)

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OUTCOME 2

Demonstrate practical skills in the use of multimedia technology using contemporary hardware and software.

Performance Criteria

a) A range of appropriate hardware is used effectively.
b) An appropriate range of features of software is used effectively.
c) Practical tasks are planned and organised with detailed guidance.
d) Practical tasks are undertaken in an appropriate range of simple contexts.

Evidence Requirements

Observation checklist showing that the candidate has demonstrated practical skills in the following **four** contexts:

- capturing, editing or creating graphic data
- capturing, editing or creating sound data
- capturing, editing or creating video data
- combining two or more data types into a single document or application

Hard copy evidence should be provided for **one** of these activities.

These practical skills may all be demonstrated in a single extended task, or in a number of smaller tasks.

The practical skills should be demonstrated in the context and at a level defined by the content statements (see Computing (Intermediate 2) Course content).

The candidate will be allowed access to books, notes and on-line help while completing the task(s).

(The content statements are also reproduced for convenience as a table in the support notes for this Unit).

The standard to be applied is illustrated in the National Assessment Bank items available for this Unit. If a centre wishes to design its own assessments for this Unit, they should be of a comparable standard.

National Unit Specification: support notes

UNIT Multimedia Technology (Intermediate 2)

This part of the Unit Specification is offered as guidance.

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

The content for this Unit is detailed below (and also in the National Course Specifications: Course details.)

Content Statement: Development Process for Multimedia Applications
Simple description of the software development process as it applies to the development of multimedia applications.
Identification of methodologies used in the creation or definition of a multimedia application, including: ♦ WYSIWYG editors and text editors to create web pages ♦ authoring software to create multimedia applications ♦ presentation software to create presentations
Simple description of the requirements for the display of a multimedia application, including web browser, file 'player' and executable file.

Content Statement: Bit-mapped graphic data
Simple description of the hardware used to capture still graphic data, including: ♦ digital camera (CCD and removable, re-usable storage) ♦ scanner (CCD)
Simple description of the storage and limitations of graphic data in compressed and uncompressed file formats, including: ♦ bitmap (uncompressed) ♦ GIF (256 colours, transparency, lossless compression) ♦ JPEG (lossy compression)
Explanation of the following terms in connection with graphics and description of the relationships between them and their effect on image quality: ♦ lossy compression ♦ resolution (number of pixels) ♦ colour depth (number of colours) ♦ file size (in bytes, Kb, Mb, Gb)
Description of the main features and applications of simple bitmap editing and creation software, including: ♦ painting programs (paintbrush, fill) ♦ image editing programs (decrease resolution, alter colour depth, crop, alter brightness and contrast, re-size or scale an image, special effects)
Identification of hardware required to display 2D graphics, including graphics card.

National Unit Specification: support notes (cont)

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Content Statement: Digitised sound data
Identification of hardware required to capture sound data, including sound card and microphone.
Simple description of the storage of sound data in compressed and uncompressed formats, including: ♦ RAW (uncompressed) ♦ WAV (compressed) (including WAV) ♦ MP3 (lossy compression)
Explanation of the following terms in connection with sounds, and description of the relationships between them and their effect on sound quality: ♦ lossy compression ♦ sampling depth/resolution (bytes) ♦ sampling frequency (Hz, KHz) ♦ sound time(s) ♦ file size (in bytes, Kb, Mb, Gb)
Description of the main features and applications of simple sound editing software, including: ♦ decrease sampling frequency ♦ decrease sampling depth ♦ crop, effects, echo, reverse, volume
Identification of need for sound card to output sound.

Content Statement: video data
Simple description of hardware required to capture digital video (digital video camera or web cam).
Simple description of the storage of video data in compressed and uncompressed formats, including: ♦ uncompressed AVI ♦ MPEG (lossy compression)
Explanation of the following terms in connection with videos and description of the relationships between them and their effect on video quality: ♦ lossy compression ♦ colour depth (bytes) ♦ resolution ♦ frame rate (fps) ♦ video time (s) ♦ file size (in bytes, Kb, Mb, Gb)
Description of the main features and applications of simple video editing software with single clips, including crop (or trimming).
Identification of need for graphics card to output video data.

National Unit Specification: support notes (cont)

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Content Statement: Vector graphics data
Description of basic features of vector graphics: ♦ scalable (independent of resolution) ♦ each object is editable ♦ layering
Identification of common attributes of vector graphics objects: ♦ drawing (shape, position, size, rotation, line, fill, layer) ♦ 3D image (shape, position, size, rotation, texture)
Identification of common file types used to store graphics in vector formats, including: ♦ SVG (scalable vector graphics) ♦ VRML (virtual reality mark-up language or WRL — world description language)

Content Statements: Synthesised sound data
Description of use of MIDI keyboard or instrument to create sound data in MIDI format.
Identification of common attributes of notes stored as MIDI data (instrument, pitch, volume, duration, tempo).

Content Statement: Implications of use of multimedia technology
Description of contemporary technologies and their uses, that demonstrate convergence of technology in relation to multimedia capabilities, including: ♦ smart phone ♦ pocket PC ♦ digital television ♦ virtual reality

National Unit Specification: support notes (cont)

UNIT Multimedia Technology (Intermediate 2)

Glossary of abbreviations for this Unit:

AVI	audio video interleaved
CCD	charge coupled device
GIF	graphic interchange format
HTML	hypertext markup language
JPEG	joint photographic experts group
MIDI	musical instrument digital interface
MPEG	motion picture expert group
MP3	MPEG-1 layer-3
RAW	'raw' (uncompressed) data
SVG	scalable vector graphics
VRML	virtual reality markup language
WRL	world description language
WYSIWYG	what you see is what you get

National Unit Specification: support notes (cont)

UNIT Multimedia Technology (Intermediate 2)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Candidates will require individual access to appropriate computer hardware and software throughout this Unit.

The two Outcomes should be delivered in an integrated way rather than sequentially. For Outcome 2, the practical activities should be taught and used to illustrate and exemplify the knowledge and understanding required for Outcome 1.

The amount of time spent on each area of content will vary depending on the teaching methodology used and the ability and prior experience of the candidates. However, the following times are suggested as a rough guide:

development process for multimedia applications	2 hours
2D graphic data — theory	3 hours
capture, edit or create bitmap graphic data	3 hours
digitised sound data — theory	3 hours
capture, edit or create digitised sound data	3 hours
video data	3 hours
capture, edit or create video data	3 hours
vector graphics	4 hours
synthesised sound	3 hours
implications of the use of contemporary multimedia technology	5 hours
combine multimedia data	4 hours

1½ hours should be set aside to:

- administer the Outcome 1 test
- gather evidence for Outcome 2

A further 2½ hours is allowed for remediation and re-assessment if required.

If the Unit is delivered as part of a Course, the Course documentation will provide further information on teaching and learning in a Course context, including the identification of a number of 'themes' to facilitate holistic learning across the Course.

National Unit Specification: support notes (cont)

UNIT Multimedia Technology (Intermediate 2)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

National Assessment Bank tests have been created specifically to assess Outcome 1 of the Unit. This assessment consists of a closed book test, and must be conducted under examination conditions. In order to gain success in this Outcome, the candidate must achieve at least the cut-off score for the test. If a centre wishes to design its own assessments for this Unit, they should be of a comparable standard.

Outcome 2 requires the candidate to demonstrate practical skills while using contemporary hardware and software. These practical skills may be demonstrated in a single extended task or a number of relatively small tasks. The skills will normally be demonstrated by the candidate during the teaching and learning activities of the Unit, rather than during separate formal assessment activities. The candidate will be allowed access to books, notes and on-line help while demonstrating the skills. The practical skills should be demonstrated in the context and at a level defined by the content statements (see Computing (Intermediate 2) Course content).

To gain success in this Outcome, the candidate must demonstrate practical skills in the following **four** contexts:

- capturing, editing or creating graphic data
- capturing, editing or creating sound data
- capturing, editing or creating video data
- combining two or more data types into a single document or application

Hard copy evidence should be provided for **one** of these activities. Note that this need not be formal documentation — simple print outs or screen are suitable evidence.

A pro-forma observation checklist for Outcome 2 is provided in the National Assessment Bank materials.

All evidence must be retained by the centre. The assessment of this Unit is subject to moderation by SQA.

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, September, 2003).