# National Unit Specification: General Information

**UNIT** Computer Graphics (Higher)

**NUMBER** D971 12

**COURSE**

**SUMMARY**
This unit is designed to develop the candidate's programming knowledge and skills and to give some experience of the user of computer graphics packages.

**OUTCOMES**
1 Outline the hardware and software factors involved in producing computer graphics.
2 Use application software to produce specified graphics
3 Write programs to generate simple computer graphics.
4 Use software techniques to generate animated graphics.

**RECOMMENDED ENTRY**
While entry is at the discretion of the centre, candidates would normally be expected to have attained Computing Studies at Intermediate 2 level. It would be useful if the candidate had also completed Computer Programming (Higher).

**CREDIT VALUE**
1 Credit at Higher.

## Administrative Information

**Superclass:** CE

**Publication date:** December 1998

**Source:** Scottish Qualifications Authority

**Version:** 01

**CORE SKILLS**

Information on the automatic certification of any core skills in this unit is published in *Automatic Certification of Core Skills* in National Qualifications (SQA, 1999).

The achievement of this unit may contribute to the development of core skills, but the assessment arrangements for the unit do not guarantee that candidates will produce sufficient evidence of core skill achievement. This means that there is no automatic certification of core skills for this unit.

# National unit specification: statement of standards

**UNIT** Computer Graphics (Higher)

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**
Outline the hardware and software factors involved in producing computer graphics.

**Performance Criteria**
a) Hardware factors are accurately outlined.
b) Software factors graphics are accurately outlined.
c) Interaction between hardware and software is accurately outlined.

**Note on range for the outcome**
Hardware factors: processor; memory; video card; display device; hard copy device.
Software factors: operating system; programming language; application software; device drivers.

**Evidence Requirements**
Written or oral evidence that the candidate can outline the hardware and software factors involved in producing computer graphics as detailed in performance criteria (a) to (c) for all classes in the range.

**OUTCOME 2**
Use application software to produce specified graphics.

**Performance Criteria**
a) Application software is used successfully to produce graphics.
b) Graphics conform to specification.
c) Input and output devices are correctly used.

**Note on range for the outcome**
Application software: painting software; drawing software.
Input devices: keyboard; pointing devices.
Output devices: display devices; hard copy devices.

**Evidence Requirements**
Performance evidence that the candidate can use application software to produce specified graphics as detailed in performance criteria (a) to (c) for all classes in the range.

## National unit specification: statement of standards (cont)

**UNIT** Computer Graphics (Higher)

**OUTCOME 3**
Write programs to generate simple computer graphics.

**Performance Criteria**
a) Simple geometric shapes are successfully generated.
b) Graphics conform to specification.
c) Text and graphic windows are used correctly.

**Note on range for the outcome**
Geometric shapes: triangle; rectangle; circle; polygon (regular, irregular).

**Evidence Requirements**
Performance evidence that the candidate can write programs to generate specified computer graphics as detailed in performance criteria (a) to (c) for all classes in the range.

**OUTCOME 4**
Use software techniques to generate animated graphics.

**Performance Criteria**
a) User-defined objects are used correctly.
b) Simple animation techniques are used correctly.
c) Animation is smooth and effective.

**Note on range for the outcome**
Animation techniques: colour-cycling; draw-erase-redraw; in-betweening.

**Evidence Requirements**
Performance evidence that the candidate can use software techniques to generate animated graphics as detailed in performance criteria (a) to (c) for all classes in the range.

# National unit specification: support notes

**UNIT** Computer Graphics (Higher)

This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

## GUIDANCE ON CONTENT AND CONTEXT

Outcome 1

The following features of computer graphics: text and graphic modes; low, medium and high resolution graphics; pixels (or equivalent); colour; palette; speed. These should be studied in relation to:

a) hardware factors: processor (speed, instruction set); memory; video card; display device; hard copy device

b) software factors: operating system; programming language; application software; device drivers.

Outcome 2

Use of a range of applications packages (eg. CAD, painting, drawing) with appropriate input/output devices (eg. keyboard, joystick, lightpen, mouse, digitiser, printer, plotter, screen display) to show the use of computer generated graphics in business, design, mapping and creative crafts.

Outcome 3

Selection of text and graphics modes, generation of simple point and line drawings, shape generation of rectangle/triangle/circle, polygon (regular, irregular) selection of background and foreground colours/shadings (logical and actual), generation of text and graphical windows, definition and use of user defined characters.

Outcome 4

The candidate should be familiar with user defined objects ('sprites', 'actors' or similar) and the use of colour cycling, draw-erase-redraw and in-betweening (interpolation of intermediate frames) techniques via commercially available packages.

## GUIDANCE ON TEACHING AND LEARNING APPROACHES

A candidate-centred, resource-based learning approach is recommended. The choice of programming language should be appropriate to the candidate's prior experience and the requirement to generate computer graphics.

Although some formal exposition and demonstration will be required, the emphasis should be on acquiring knowledge and understanding of computer graphics through the use of application software selected for its suitability, and by the programming element. Discussion of features should take place as they arise naturally within the unit.

## National unit specification: support notes (cont)

**UNIT** Computer Graphics (Higher)

The study of application software should take place in a resource based environment. The candidate should carry out a series of predetermined tasks appropriate to the software and input/output devices. Tasks successfully completed should be marked off against a checklist. On completion of the study of one package the candidate should select a further package until a range of software and hardware has been examined.

Similarly, the programming elements of the unit should be covered by a series of short programming exercises to be solved by the candidate. A commercially available package may be used by the candidate to create complex shapes. The accompanying plotting routines could be used as subroutines to programs constructed by the candidate, to create the 'arcade' style graphics possible with these machine level routines. A portfolio of appropriately documented listings should be kept by the candidate.

**GUIDANCE ON APPROACHES TO ASSESSMENT**

Centres may use the instruments of assessment which are considered to be most appropriate. Examples of instruments of assessment which could be used are as follows:

Outcome 1

A series of short-answer questions relating to hardware and software factors in computer graphics and the interaction between these.

Outcome 2

A series of short practical exercises requiring candidates to produce specified graphics using application software.

Outcome 3

A series of short practical exercises requiring candidates to produce specified graphics using a programming language.

Outcome 4

A series of short practical exercises requiring candidates to produce specified animations using application software.

During the work of the unit, candidates should have several opportunities to develop their practical skills and should be assessed at appropriate points. Terminology should be presented in context throughout the module. Where the candidate is unsuccessful in achieving an outcome, provision should be made for additional support and re-assessment.

## National unit specification: support notes (cont)

**UNIT** Computer Graphics (Higher)

**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 alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements* (SQA, 1998).