

## National Unit Specification: general information

**UNIT** Information Systems Interfaces (Advanced Higher)

**NUMBER** DV51 13

**COURSE** Information Systems (Advanced Higher)

### SUMMARY

This Unit is designed to develop knowledge and understanding of the principles of information system interface design and practical skills in the design, development, and evaluation of an interface. This knowledge and understanding, and these practical skills, may then be applied by the candidate to design and develop an interface for an information system.

The Unit is designed as an option for candidates undertaking the Advanced Higher Information Systems Course, but is also suitable for anyone wishing to extend and deepen their experience of information systems beyond Higher level.

### OUTCOMES

- 1 Demonstrate knowledge and understanding of the principles, features, design, development and evaluation of information system interfaces.
- 2 Demonstrate practical skills in the design, development and evaluation of information system interfaces.

### 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:

- ◆ Advanced Higher Database Analysis and Design Unit
- ◆ Advanced Higher Database Implementation and Testing Unit
- ◆ Higher Relational Database Systems Unit
- ◆ Higher Information Systems

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### Administrative Information

**Superclass:** CV

**Publication date:** October 2005

**Source:** Scottish Qualifications Authority

**Version:** 02 (March 2006)

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## **National Unit Specification: general information (cont)**

### **CREDIT VALUE**

1 credit at Advanced Higher (8 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.*

### **CORE SKILLS**

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

## **National Unit Specification: statement of standards**

### **UNIT Information Systems Interfaces (Advanced 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**

Demonstrate knowledge and understanding of the principles, features, design, development and evaluation of information system interfaces.

##### **Performance criteria**

- (a) A wide range of advanced information systems terminology is used appropriately.
- (b) Technically accurate descriptions and explanations are related to familiar and unfamiliar contexts.
- (c) 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, techniques and applications of human-computer interfacing accurately and concisely.

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 Information Systems (Advanced Higher) Course content) in each of the following areas:

- ◆ interface modes
- ◆ intelligent interfaces
- ◆ interface modelling and design
- ◆ usability testing and evaluation

(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.

#### **OUTCOME 2**

Demonstrate practical skills in the design, development and evaluation of information system interfaces.

##### **Performance criteria**

- (a) Hardware and software is used independently, effectively and efficiently.
- (b) Practical tasks are planned and organised independently.
- (c) Practical tasks are undertaken in an appropriate range of familiar and unfamiliar contexts.

## **National Unit Specification: statement of standards (cont)**

### **UNIT**      Information Systems Interfaces (Advanced Higher)

#### **Evidence Requirements**

Observational checklist showing that the candidate has demonstrated the following skills in the context and at a level defined by the content statements for this Unit (see Information Systems (Advanced Higher) Course content):

- ◆ interface design
- ◆ interface implementation
- ◆ interface evaluation

Hard copy evidence should be provided of interface design and implementation.

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

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 Information Systems Interfaces (Advanced Higher)

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 statements in the left-hand column describe relevant content covered in an optional Unit at Higher level, and are included here to clarify the context for the new learning for this Unit. They indicate the prior learning required by the candidate before undertaking the new and assessable learning for this Unit. Content in the right-hand column is the new and assessable content of this Unit.

| Content Statements: Interface modes  |  |
|--|--|
| Higher   | Advanced Higher  |
|  | Description of the factors which have contributed to the development of human computer interfaces, including technological (hardware, software), economic, social  |
| <i>Applied Multimedia (H)</i><br><i>Description of multimedia delivery media and exemplification of appropriate uses: CD-ROM / DVD-ROM, kiosk, WWW, mobile communication devices, hybrids, virtual reality</i> | Description of a range of interfaces, including <ul style="list-style-type: none"> <li>◆ desktop operating systems</li> <li>◆ web sites</li> <li>◆ mobile phones</li> <li>◆ palmtops or personal digital assistants (PDAs)</li> <li>◆ public information kiosks</li> <li>◆ cash machines</li> </ul> In terms of <ul style="list-style-type: none"> <li>◆ mode</li> <li>◆ methods of input/output</li> <li>◆ typical users</li> <li>◆ physical constraints</li> </ul> |
|  | Identification, description and exemplification of interface modes: <ul style="list-style-type: none"> <li>◆ Graphical (graphical user interface, direct manipulation)</li> <li>◆ Textual (command line, question and answer, form filling, natural language)</li> <li>◆ Sensory:               <ul style="list-style-type: none"> <li>— auditory (speech, sound)</li> <li>— touch</li> </ul> </li> <li>◆ Multimodal interfaces</li> </ul>                           |
|  | Description of the operation of a user interface in terms of syntax and semantics.   |

## National Unit Specification: support notes (cont)

### UNIT Information Systems Interfaces (Advanced Higher)

| <b>Content Statements: Intelligent interfaces</b>  |  |
|--|--|
| <i>Higher</i>  | <b>Advanced Higher</b>   |
| <p><i>Internet (H)</i><br/> <i>Description of the use of web authoring packages in web page design (including page layout design and uploading of pages)</i></p> | <p>Description of the trend towards increasing use of intelligent techniques in information systems interfaces.<br/>                     Description of the characteristics and benefits of intelligent interfaces.</p>  |
|  | <p>Description and exemplification of applications of intelligent interfaces, including:</p> <ul style="list-style-type: none"> <li>◆ Predictive and adaptive user interfaces                             <ul style="list-style-type: none"> <li>— mobile phone predictive text</li> <li>— grammar and spelling checkers</li> <li>— adaptive menus in applications and operating systems</li> <li>— agent-based interfaces</li> </ul> </li> <li>◆ Natural language interaction                             <ul style="list-style-type: none"> <li>— machine translation</li> <li>— natural language querying</li> <li>— command and control systems</li> <li>— speech driven software</li> </ul> </li> </ul> |

## National Unit Specification: support notes (cont)

### UNIT Information Systems Interfaces (Advanced Higher)

| <b>Content Statements: Interface modelling and design</b> |   |
|---|---|
| <i>Higher</i>   | <b>Advanced Higher</b>  |
|   | Identification and description of the stages of the LUCID (Logical User Centred Interaction Design) methodology: <ul style="list-style-type: none"> <li>◆ envision</li> <li>◆ discovery</li> <li>◆ design foundation</li> <li>◆ design detail</li> <li>◆ build</li> <li>◆ release</li> </ul> and their relationship to the stages of the stages of the systems analysis and design life cycle |
|   | Description of the characteristics and needs of different classes of user: <ul style="list-style-type: none"> <li>◆ novice</li> <li>◆ knowledgeable intermittent</li> <li>◆ expert/frequent users</li> </ul>  |
|   | Description and exemplification of the characteristics and relative merits of storyboards, state transition diagrams and prototypes as methods of interface design  |
|   | Storyboards: <ul style="list-style-type: none"> <li>◆ representation of layout, textual and graphical elements, audio, video and animated content</li> <li>◆ representation of sequence of screens</li> <li>◆ use as a cheap, quick, easily amended means of providing a mocked-up interface at an early stage</li> </ul>   |
|   | State transition diagrams: <ul style="list-style-type: none"> <li>◆ representation of layout, navigational elements, links to other content and transition between screens</li> </ul>   |
|   | Prototyping: <ul style="list-style-type: none"> <li>◆ low fidelity: paper prototyping</li> <li>◆ high fidelity: rapid application development (RAD)</li> <li>◆ horizontal</li> <li>◆ vertical</li> </ul>  |

## National Unit Specification: support notes (cont)

### UNIT Information Systems Interfaces (Advanced Higher)

| <b>Content Statements: Usability testing and evaluation</b>   |   |
|---|---|
| <b>Higher</b>   | <b>Advanced Higher</b>  |
| <p><i>Applied Multimedia (H)</i><br/> <i>Description and exemplification of the different types of testing that should be carried out including: screen testing, integration testing, acceptance testing, usability testing</i></p> | <p>Description of the characteristics and uses of qualitative techniques for usability testing:</p> <ul style="list-style-type: none"> <li>◆ thinking aloud protocol</li> <li>◆ co-discovery method</li> <li>◆ question-asking protocol</li> <li>◆ eye tracking</li> </ul>  |
|   | <p>Description of the characteristics and uses of quantitative measurement techniques for usability testing:</p> <ul style="list-style-type: none"> <li>◆ time to learn</li> <li>◆ speed of task performance</li> <li>◆ user error rates</li> <li>◆ user retention of commands over time</li> <li>◆ subjective user satisfaction</li> </ul>   |
|   | <p>Description and exemplification of the characteristics and uses of a range of quality inspection methods, including:</p> <ul style="list-style-type: none"> <li>◆ heuristic evaluation</li> <li>◆ walkthroughs</li> <li>◆ feature set</li> <li>◆ consistency inspection</li> <li>◆ adherence to standards (including standard operating system design guidelines, web accessibility guidelines)</li> </ul> |
|   | <p>Description of the characteristics and uses of a range of inquiry methods, including</p> <ul style="list-style-type: none"> <li>◆ surveys</li> <li>◆ questionnaires</li> <li>◆ user performance data logging</li> <li>◆ self reporting logs</li> </ul>   |

### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

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

In particular, candidates will require access to a range of suitable interfaces, which could include desktop operating systems (eg Windows®, MacOS®), web sites, mobile phones, palmtops or personal digital assistants (PDAs), games consoles, public information kiosks, cash machines.

The two Outcomes should be delivered in an integrated way rather than sequentially. For Outcome 2, the practical activities, both computer based and non-computer-based, should be taught and used to illustrate and exemplify the knowledge and understanding required for Outcome 1, whenever this is possible.



## National Unit Specification: support notes (cont)

### UNIT Information Systems Interfaces (Advanced Higher)

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:

|                                  |          |
|----------------------------------|----------|
| Interface modes                  | 8 hours  |
| Intelligent interfaces           | 4 hours  |
| Interface modelling and design   | 14 hours |
| Usability testing and evaluation | 10 hours |

1½ hours would be set aside to:

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

A further 2 ½ 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.

### 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 supervision. 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 will normally be demonstrated in a single extended task or a number of relatively small tasks. The task(s) will normally be undertaken by the candidate as part of the teaching and learning activities of the Unit, rather than as separate formal assessment activities. The candidate will be allowed access to books, notes and on-line help while completing the task(s). The practical skills should be demonstrated in the context defined in the content statements (see Information Systems (Advanced Higher) Course content).

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

- ◆ interface design
- ◆ interface implementation
- ◆ interface evaluation

Hard copy evidence should be provided of interface design and implementation.

Evidence of interface design could include paper prototypes, storyboards, or RAD prototyping.

Evidence of interface implementation could comprise screen shots of interfaces developed to model the designs above, or of an interface developed as part of the Coursework project.

## **National Unit Specification: support notes (cont)**

### **UNIT        Information Systems Interfaces (Advanced Higher)**

Interface evaluation should include usability testing techniques applied to a range of interfaces. Suitable interfaces include desktop operating systems (eg Windows®, MacOS®), web sites, mobile phones, PDAs, games consoles, public information kiosks, cash machines.

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

All evidence for Outcome 2 should be gathered under ‘open book’ conditions and must be retained by the centre. The assessment of this Unit is subject to moderation by SQA.

### **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 document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* (SQA, 2004).