# National Unit Specification: general information

**UNIT** On-line Database Systems (Advanced Higher)

**NUMBER** DV50 13

**COURSE** Information Systems (Advanced Higher)

## SUMMARY

This Unit is designed to develop knowledge and understanding of the principles, development and uses of on-line database systems, in the context of server side databases, and provides an opportunity to apply this knowledge to solve problems through the use of contemporary hardware and software.

It 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 on-line information systems beyond Higher level.

## OUTCOMES

1 Demonstrate knowledge and understanding of the principles, features, development and techniques of on-line database systems.
2 Demonstrate practical skills by applying knowledge and understanding of the principles, features and techniques of on-line database systems.

## 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

## Administrative Information

**Superclass:** CD

**Publication date:** October 2005

**Source:** Scottish Qualifications Authority

**Version:** 02 (March 2006)

# 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 On-line Database Systems (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, development and techniques of On-line Database Systems.

### 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 of systems analysis and design 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 across the range of the Unit content (see Information Systems (Advanced Higher) Course content) in each of the following areas:

- Internet Developments
- Database Connectivity
- Structured Query Language
- Application Development

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

The standard to be applied and the breadth of coverage 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 by applying knowledge and understanding of the principles, features and techniques of on-line database systems.

### 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 On-line Database Systems (Advanced Higher)

### Evidence Requirements

An observation checklist showing that the candidate has carried out practical activities, demonstrating all of the following practical skills, in the context of producing a data model, as defined in the content statements for this Unit (see Information Systems (Advanced Higher) Course content):

- use of a server-based database management tool
- creation of queries using SQL
- use of server-side scripting language

Hard copy evidence should be provided of:

- Server-side scripts
- HTML Output (completed pages and underlying code)

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 and the breadth of coverage 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 On-line Database Systems (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: Internet Developments** | |
|---|---|
| ***Higher*** | **Advanced Higher** |
| *Internet (H)*<br>*Description of contemporary technical developments related to Internet usage and operation including:*<br>♦ *web based databases*<br>♦ *dynamic page design* | Description of applications of on-line database systems including<br>♦ Content Management Systems<br>♦ Customer Relationship Management<br>♦ E-commerce Platforms<br><br>Comparison of Open Source and Commercial On-line Database Software and related issues:<br>♦ cost effectiveness<br>♦ security<br>♦ flexibility and adaptability<br>♦ ongoing support and development by a community of users<br><br>Description of applications and features of Electronic Data Interchange (EDI):<br>♦ transaction standardisation<br>♦ translation software<br>♦ communications<br>♦ legal restrictions |

## National Unit Specification: support notes (cont)

**UNIT** On-line Database Systems (Advanced Higher)

| Content Statements: Database Connectivity | |
|---|---|
| ***Higher*** | **Advanced Higher** |
| | Description and exemplification of the requirements for connection to database server<br>♦ username/password<br>♦ server address<br>♦ database name<br><br>Description of use of a server-based database management tool/application<br>♦ to connect a database client to a server<br>♦ to create/modify/delete table structures |

| Content Statements: Structured Query Language | |
|---|---|
| ***Higher*** | **Advanced Higher** |
| | Exemplification and application of the uses of SQL to create simple and complex queries:<br>♦ Data Manipulation Language (DML) – Insert, Update, Delete<br>♦ Data Query Language (DQL) – Select<br>— keywords or clauses of the select statement — Select, From, Where, Order By<br>— logical operators — Is Null, Between, In, Like, Exists, Unique, All and Any<br>— Negating Conditions with the Not Operator — Not Equal, Not Between, Not In, Not Like, Is Not Null, Not Exists, Not Unique<br>— Aggregate Functions — Count, Sum, Max, Min, Avg<br>— Sorting and Grouping Data — Group By, Order By<br>— Equi-joins/inner joins |

## National Unit Specification: support notes (cont)

**UNIT** On-line Database Systems (Advanced Higher)

| Content Statements: Application Development | |
|---|---|
| ***Higher*** | **Advanced Higher** |
| *Internet (H)*<br>*Description of the use of web authoring packages in web page design (including page layout design and uploading of pages).*<br><br>*Comparison of the use of web authoring packages and direct HTML coding.*<br><br>*Description and exemplification of:*<br>♦ *cascading style sheets*<br>♦ *client side scripting (including form validation and alerts)* | Description and exemplification of server-side scripting language for<br>♦ Server connection<br>♦ Database selection<br>♦ Execution of SQL queries and extraction of results<br><br>Description and exemplification of forms processing to insert and amend data.<br><br>Description of structure of HTML forms, including<br>♦ the <form> element and its action and method attributes<br>♦ the <input> element and its type, name and value attributes<br>♦ the <button> element and its type, name and value attributes |

### 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. Appropriate practical activities should be taught and used to illustrate and exemplify the knowledge and understanding required for Outcome 1.

Candidates who have completed the *Relational Database Systems* and/or *The Internet* Unit at Higher level should already have covered some or all of the content listed in the left hand column of the content grids, but may well need to revise this material before progressing to the right hand column.

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:

| | |
|---|---|
| Internet Developments | 9 hours |
| Database Connectivity | 6 hours |
| Structured Query Language | 9 hours |
| Application Development | 12 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.

## National Unit Specification: support notes (cont)

## UNIT On-line Database Systems (Advanced Higher)

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 the following practical skills in the context of producing a data model of an existing system:

- use of a server-based database management tool
- creation of queries using SQL
- use of server-side scripting language

Evidence may be obtained using an open book practical exercise where candidates are presented with a server-side database with limited requirements for insertion, modification, deletion and read operations. The candidate is not required to design and implement this database.

A minimum of three scripts should be created to access and maintain the data. It is permissible to combine these scripts into one program provided suitable control structures are used.

Hard copy evidence should be provided of:

- Server-side scripts
- HTML Output (completed pages and underlying code)

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.

## National Unit Specification: support notes (cont)

**UNIT** On-line Database Systems (Advanced Higher)

### 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).