National Unit Specification: general information

UNIT   Database Implementation and Testing (Advanced Higher)

NUMBER   DV4Y 13

COURSE   Information Systems (Advanced Higher)

SUMMARY

This Unit is designed to develop knowledge and understanding and practical skills in the implementation, testing, evaluation, documentation and maintenance of database systems.

On completion of the Unit, the candidate should be able to apply this knowledge and understanding, and these skills to solve practical problems.

It is designed for candidates undertaking the Advanced Higher Information Systems Course, but it is also suitable for anyone wishing to extend and deepen their experience of relational database systems beyond Higher level.

OUTCOMES

1   Demonstrate knowledge and understanding of the principles of database implementation, testing, documentation, evaluation and maintenance.
2   Demonstrate practical skills in the application of the principles of database implementation, testing, documentation, evaluation to a complex database related problem.

National Unit Specification: general information (cont)

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:

♦ Higher Relational Database Systems Unit
♦ Higher Information Systems

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   Database Implementation and Testing (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 of database implementation, testing, documentation, evaluation and maintenance.

Performance criteria

(a)   A range of advanced database terminology is used appropriately.
(b)   Technically accurate descriptions and explanations are related to a range of 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 database implementation, testing, documentation, evaluation and maintenance 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:

♦   overview of database systems implementation
♦   testing
♦   database development
♦   documentation, evaluation and maintenance

(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 in the application of the principles of database implementation, testing, documentation, evaluation to a complex database related problem.

National Unit Specification: statement of standards (cont)

UNIT   Database Implementation and Testing (Advanced Higher)

Performance criteria

(a)   Appropriate hardware is used effectively and efficiently.
(b)   A wide range of appropriate features of software is used effectively and efficiently.
(c)   Practical tasks are planned and organised independently.
(d)   Practical tasks are undertaken in an appropriate range of familiar and unfamiliar contexts.

Evidence Requirements

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

♦   creation of test data
♦   implementation of complex database
♦   systematic testing
♦   creation of documentation

Hard copy evidence should be provided of the implemented database.

These practical skills may all be demonstrated in a single extended development task, or in a number of smaller tasks, or during the process of completing the Coursework Project.

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   Database Implementation and Testing (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 the content covered in the Relational Database Systems 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: Overview of database system implementation	
Higher	**Advanced Higher**
	Description of stages of implementation ♦ creation of test plan ♦ database development ♦ testing ♦ documentation ♦ system conversion techniques ♦ post implementation review (evaluation) ♦ maintenance Explanation of the iterative nature of the process.

Content Statements: Testing	
Higher	**Advanced Higher**
	Description of types of testing ♦ component testing ♦ integrative testing ♦ systems testing ♦ acceptance testing
	Description and exemplification of creation of test plan ♦ elements to be tested ♦ sequence of testing ♦ types of testing ♦ creation of test data values (normal, extreme and exceptional)

National Unit Specification: support notes (cont)

UNIT   Database Implementation and Testing (Advanced Higher)

Content Statements: Testing
Exemplification of systematic testing including ♦   summary of results ♦   rectifying errors and bugs

Content Statements: Database Development	
Higher	**Advanced Higher**
Implementation of database system based on a data model, including entity/relationship diagram and data dictionary *Description and implementation of complex queries including: sorting (multiple fields, ascending/descending), searching (multiple fields, across linked / related tables)* *Use of related tables as sources for data entry (including lookups).*	Exemplification of: ♦ tables ♦ relationships ♦ queries ♦ forms ♦ reports ♦ user interface ♦ scripting
	Description and use of different conversion techniques: ♦ piloting ♦ parallel ♦ phased ♦ direct

Content Statements: Documentation, Evaluation and Maintenance	
Higher	**Advanced Higher**
	Description and exemplification of documentation ♦ user guide ♦ system design documentation, including models and design of system
	Description of contents and purpose of evaluation ♦ comparison to specification ♦ ease of use ♦ maintainability
	Description of types of maintenance ♦ corrective ♦ adaptive ♦ perfective

National Unit Specification: support notes (cont)

UNIT   Database Implementation and Testing (Advanced Higher)

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. These practical activities can be used to generate evidence for Outcome 2.

The main purpose of the unit is to develop knowledge and understanding and practical skills in the implementation, testing, evaluation, documentation and maintenance of database systems. For those candidates undertaking the Information Systems Course, this unit will provide a suitable basis for undertaking the implementation, testing, documentation and evaluation stages of the Coursework Project.

The amount of time spent on each content area 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:

Overview of database system implementation	2 hours
Testing	4 hours
Database development	4 hours
Database implementation	22 hours
Documentation, evaluation and maintenance	4 hours

Where this Unit is taught as part of the AH Information Systems Course, the time allocated for database implementation can be used for activities which will contribute towards the Coursework Project.

1½ hours should 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.

National Unit Specification: support notes (cont)

UNIT   Database Implementation and Testing (Advanced Higher)

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 in database implementation, testing, documentation, and evaluation. These skills will normally be demonstrated by the candidate during the implementation and testing of a database to be used as the basis of the coursework project report. The candidate will be allowed access to books, notes and on-line help while completing the task(s).

The assessment of Outcome 2 is based on a record of work produced by the candidate, which may include hand-written notes, diagrams and screen shots. A formal report is not required for Unit assessment.

To complete this Outcome, the candidate must demonstrate practical skills in the following contexts and at an appropriate level as defined by the content statements for this Unit (see Information Systems (Advanced Higher) Course content):

♦   creation of test data
♦   implementation of complex database
♦   systematic testing
♦   creation of documentation

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

Hard copy evidence should be provided of the implemented database.

All evidence 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).