

National Unit Specification: general information

UNIT Database Advanced (Higher)

NUMBER DC9V 12

COURSE PC Passport

SUMMARY

This unit is designed to enable candidates to develop database skills to a level expected in the workplace. The candidate will be able to create a database (including a number of related tables), create data entry forms, extract information from the database (using filters and queries) and generate summary reports.

OUTCOMES

- 1 Create tables to store and forms to manipulate information.
- 2 Extract information using a range of queries and filters.
- 3 Present information using reports.

RECOMMENDED ENTRY

Entry is at the discretion of the centre. Candidates should possess prior knowledge and experience of computer software. No prior experience of databases is required.

CREDIT VALUE

1 credit at Higher (6 SCOTCAT points at SCQF level 6*)

**SCOTCAT 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 SCOTCAT points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Administrative Information

Superclass: CD

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National Unit Specification: general information (cont)

CORE SKILLS

This unit contributes to IT Core Skills at Higher Level.

Information on the automatic certification of any core skills in this unit is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, publication code BA0906).

National Unit Specification: statement of standards

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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

Create tables to store and forms to manipulate information.

Performance criteria

- a) The database design eliminates data redundancy.
- b) The database design is accurately implemented using a number of related tables.
- c) The selection and implementation of data types is correct.
- d) Form creation tools are used efficiently and effectively.
- e) Data validation is used effectively to ensure the accuracy of the data.
- f) Data entry forms are intuitive to use and attractively presented.

Note on range for the outcome

Data types: text; number; Boolean; date/time; graphic.

Form objects: text box; list box; label; navigation buttons; check box; image box.

Evidence requirements

Performance evidence that the candidate can create a database to the standards defined by performance criteria (a) to (c). Candidates must create a database consisting of a minimum of five related tables, collectively containing the full range of data types.

Performance evidence that the candidate can create data entry forms to the standards defined by performance criteria (d) to (f). The forms must permit the tables to be populated.

Test data for the tables and forms may be supplied or generated.

Evidence of knowledge and understanding will consist of 15 objective questions relating to the underpinning knowledge relevant to performance criteria (a) to (f). Candidates are required to produce at least 10 correct answers.

National Unit Specification: statement of standards (cont)

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OUTCOME 2

Extract information using a range of queries and filters.

Performance criteria

- a) Query creation tools are used efficiently and effectively.
- b) Queries are created to meet specific criteria.
- c) Queries make use of expressions to calculate data values.
- d) Filters are created and applied to meet specific criteria.
- e) Navigation of query or filter results is efficient and effective.

Note on range for the outcome

Criteria: Single field; multiple fields; single value; multiple values; exact; inexact; sorting.
Expressions: general (including Sum and Average)

Evidence requirements

Performance evidence that the candidate can create queries to the standards defined by performance criteria (a) to (c) and (e). Candidates must create a minimum of four queries spanning the defined range including one which selects data from related tables.

Performance evidence that the candidate can create filters to the standards defined by performance criteria (d) to (e). Candidates must create a minimum of four queries spanning the defined range.

Evidence of knowledge and understanding will consist of 15 objective questions relating to the underpinning knowledge relevant to performance criteria (a) to (e). Candidates are required to produce at least 10 correct answers.

OUTCOME 3

Present information using reports.

Performance criteria

- a) Report creation tools are used efficiently and effectively.
- b) Reports are designed to meet specific criteria.
- c) Reports are formatted to meet user requirements.
- d) Reports are amended to include additional information.

Note on range for the outcome

Criteria: multiple values, exact, inexact, sorting.
Formatting: text formatting (including font, size); number formatting; currency formatting.

Additional information: expressions (including summary totals and averages); label; text box; image box.

National Unit Specification: statement of standards (cont)

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Evidence requirements

Performance evidence that the candidate can create reports to the standards defined by performance criteria (a) to (d). Candidates must create a minimum of two reports spanning the defined range include one which draws data from related tables via a query.

Evidence of knowledge and understanding will consist of 10 objective questions relating to the underpinning knowledge relevant to performance criteria (a) to (d). Candidates are required to produce at least 7 correct answers.

EVIDENCE REQUIREMENTS FOR THE UNIT

The assessment of knowledge and understanding can be combined into a single instrument of assessment consisting of 40 objective questions relating to outcomes 1, 2 and 3. The distribution of questions should adhere to the evidence requirements for each outcome:

Outcome 1	15 questions
Outcome 2	15 questions
Outcome 3	10 questions.

The combined pass mark for this assessment is 27 correct answers (out of 40 questions). If a single instrument of assessment is used, it is not necessary to satisfy the pass mark for each outcome. Candidates will be deemed to have achieved all outcomes (with respect to their knowledge and understanding) if their combined score is at least 27 out of 40. However, for the purposes of re-assessment, the individual thresholds for each outcome will be followed.

National Unit Specification: support notes

UNIT Database Advanced (Higher)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 40ours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This unit may be delivered as a stand-alone unit or in combination with other units as part of the PC Passport award at Higher level.

Corresponding to Outcome 1-3

This unit develops practical database skills equivalent to those expected in a business situation. The unit requires the use of relational database software which includes the ability to create related tables to store data, forms to manipulate data and queries and reports to analyse and present data. Software which does not provide these features does not provide a suitable context within which to present the unit.

Outcome 1

This outcome relates to the construction of a database and the preparation of forms to manipulate the data within the database. The emphasis is on the practical application of software skills rather than a full understanding of database analysis techniques such as normalisation. The performance criteria define the standards which should be applied to candidate activity.

Performance criterion (a) requires the candidate to ensure that each item of data in the database is stored only once. For example: a database which stores orders of products for customers should be composed of multiple tables each relating to a real world object i.e. *products*, *customers*, *orders* and perhaps (if more than one product is allowed on each order), *order lines* rather than one table containing all the order details. The candidate is not required to complete the data analysis to produce this data model but the candidate is expected to produce a database design once given the analysis data as a starting position. The candidate may have to adapt the given analysis in order to meet the requirements of the software package being used. The design may take the form a data dictionary containing each field, the table it is part of and other properties such as data type, size, validation, etc.

The tasks set for candidates should be relatively complex but typical of those tasks expected of employees in a working situation (such as efficiently organising data relating to a specific project).

Performance criteria (b) and (c) relate to the accuracy and correctness of the implemented data model. The candidate must ensure that appropriate validation, formatting, data types and other properties are correctly assigned to the fields created. Relationships must be correctly created between related tables and candidates must ensure that the implementation closely matches the design.

National Unit Specification: support notes (cont)

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Performance criterion (d) relates to the efficient and effective use of form creation tools. Effective use means the candidate uses the facilities to accomplish a specific task – such as creating a form which allows data entry to a specific selection of tables e.g. a form to facilitate the entry of an order. Candidates' effectiveness should be gauged over an extended period of time – not during a single instance of the use of a specific facility. So, for example, before judging that a candidate can use text boxes, the assessor should observe the candidate's use of text boxes within forms creation over an extended period and using a variety of examples to judge the candidate. The efficient use of these facilities requires candidates to use them without assistance and without repeated attempts. Note the range of form objects that must be used.

Performance criterion (e) relates to the enforcement of validation within both table design and form design. It is essential that the candidate appreciates the need for data accuracy and methods by which this can be enforced by the database package. Candidates should be able to implement validation for all appropriate fields. The candidate should be able to implement presence, range and restricted choice types of validation in order to meet a range of requirements.

Performance criterion (f) requires candidates to consider the ease of use of the forms created. The order of fields on the form should be logical and the layout of the form should be clear and concise. The candidate should consider the sequence in which the fields are accessed and the ease of navigation between fields and individual records. The use of buttons to add functionality should be considered such as to print, navigate and save. Consideration should also be given to the use of sub-forms to ease the process of entering data for related tables.

Outcome 2

This outcome relates to the creation and execution of queries and filters to meet specific requirements. The candidate is required to demonstrate ability to create and execute queries to extract data to meet specific demands. Filters are essentially queries which are applied via data entry forms. The fields selected for the filter are those used in the data entry form and criteria is applied to one, some or all of the fields to select the required data from the base tables.

Ideally, the use of both queries and filters should be related to business situations where there is a requirement to select relatively complex subsets of the data held within the database.

Performance criterion (a) relates to the efficient and effective use of query creation tools. Effective use means the candidate uses the facilities to accomplish a specific task – such as creating a query to meet specific criteria e.g. selecting customers with outstanding invoices. Candidates' effectiveness should be gauged over an extended period of time – not during a single instance of the use of a specific facility. The efficient use of these facilities requires candidates to use them without assistance and without repeated attempts.

Performance criterion (b) relates to the candidates ability to design queries to meet a range of situations. It is expected that the candidate will be able to produce four queries which encompass all of the items from the range. Therefore the candidate may be expected to create queries with; multiple values entered against a single field (use of OR operator), multiple fields with individual values (use of AND operator), value criteria which gives inexact results (such as *greater than*, *less than* or the use of

wildcards), value criteria which gives exact results (such as equals) and sorting (on single and multiple fields, ascending and descending with consideration of precedence within the sort).

National Unit Specification: support notes (cont)

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Performance criterion (c) refers to the candidates ability to use expressions to complete non-complex calculations within queries. Typical tasks would be to calculate totals, averages, maximums, minimums and other simple calculations for a specific set of data based on the field values within the query. This will require the candidate to develop a limited understanding of expression building within the query creation tools of the database application.

Performance criterion (d) relates to the creation of filters to meet specific needs. It is important to emphasise that the use of filters should be meaningful within the context of the data used. For example; to select a specific customers record via the data entry form so that the customer's address may be updated.

It is expected that the candidate will be able to produce four filters which encompass all of the items from the range. Therefore the candidate may be expected to create filters with; multiple values entered against a single field (use of OR operator in query), multiple fields with individual values, value criteria which gives inexact results (such as *greater than*, *less than* or the use of wildcards), value criteria which gives exact results (such as equals) and sorting (on single fields only).

Performance criterion (e) relates to the navigation of the resultant answer table (for query) or data form record set (for filter). The candidate should be able to use any navigation buttons (next records, previous records, first record, last record etc.) and use any direct navigation tool (such as the entry of record number to select a single record). The use of these or similar tools for navigation should be efficient and effective.

Outcome 3

Performance criterion (a) relates to the efficient and effective use of report creation tools. Effective use means the candidate uses the facilities to accomplish a specific task – such as creating a report to meet specific criteria e.g. listing customers with unfulfilled orders. Candidates' effectiveness should be gauged over an extended period of time – not during a single instance of the use of a specific facility. The efficient use of these facilities requires candidates to use them without assistance and without repeated attempts.

Performance criterion (b) relates to the candidates ability to design queries to meet a range situations. It is expected that the candidate will be able to produce two reports which encompass all of the items from the range. Each report may require the creation of a related query and there is the possibility to integrate the assessment of Outcome 2 and Outcome 3 in this area.

The candidate should be expected to create reports which select from the underlying base tables in a number of ways specific to the criteria in the range.

Performance criterion (c) and (d) require candidates to appropriately format the report to ensure that it is fit for purpose. The candidate should carefully consider the use of the required items from the range and the location of data and additional items within the report for best effect. The formatting of the report should be to a professional business standard and typical tasks for the candidate might include the creation of a customer invoice, a summary sales report or a stock report.

The candidate is required to add additional items (such as expressions) to the report and may require the use of expression building tools within the database software.

National Unit Specification: support notes (cont)

UNIT Database Advanced (Higher)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

A practical, hands-on approach to learning should be adopted. The emphasis should be on learning-by-doing. Terminology and underpinning knowledge should be introduced in a practical context.

The actual distribution of time between outcomes is at the discretion of the centre. However, the following distribution is suggested as Outcomes 1 and 2 will require a greater amount of analytical skill and technical competence:

Outcome 1	14 hours
Outcome 2	14 hours
Outcome 3	12 hours

Throughout this unit, candidate activities should relate to the business application of database systems. For example, candidates may be permitted to choose business scenarios which appropriately relate to their aspirations or real world experience – rather than one specific application prescribed by their teacher/trainer.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

It is recommended that centres combine the assessment of knowledge and understanding into a single objective question paper. Re-assessment should be undertaken by re-assessing the specific outcomes which have not been passed.

Evidence of practical competence should be stored in a portfolio. At the completion of this unit the portfolio should contain a range of evidence, drawn from the evidence requirements for each outcome. This will include evidence of table designs, completed tables containing data and data entry forms (Outcome 1); query design, query results and filters (Outcomes 2); and hard copy of reports (Outcome 3).

This material may be stored in paper or electronic format. Centres may choose to store candidate evidence in an electronic portfolio (e-portfolio).

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, publication code AA0645).