Unit 7: Databases – design and use (LEVEL 2)

Learning outcomes

By completing this unit candidates will develop a thorough knowledge and understanding of how to create and use a relational database.

Candidates will be able to:

- design a relational database to meet the needs of an organisation
- construct a database according to a design
- interrogate a database
- create reports
- create a user interface
- test a database and make recommendations for improvements.

It is anticipated that a candidate will require 60 guided learning hours to complete this unit.

Assessment objectives	Knowledge, understanding and skills
1 Design a relational database to meet the needs of an organisation	Design a relational database and include: • user requirements (purpose and audience) • table structure eg: primary keys, field names, field types, field lengths and any validation eg: combo boxes, validation rules, input masks • relationships between tables • data entry forms to be used
2 Construct the database according to the design	Using the design build the relational database with **a minimum of 20 records in each table**, including eg: • two or more related tables • forms to enter data eg templates, customised forms
3 Interrogate the database	Simple on linked tables, eg: • sort • query using simple criteria Complex on linked tables, eg: • sort on more than one field • query using multiple criteria • query using complex criteria (eg: NOT, BETWEEN, AND, etc) Choice of queries implemented described/explained/justified
4 Create reports	Create reports for queries • use standard templates and/or create custom reports
5 Create a user interface	Implement a user interface to give access to eg: • forms • queries • reports

Assessment objectives	Knowledge, understanding and skills
6 Test the database	Test plan includes the following checks, eg: • database meets original design brief • validation • forms • queries • reports Test database according to test plan and make necessary changes to improve functionality of database

Assessment

This unit is centre assessed and externally moderated.

In order to achieve this unit, candidates must produce a portfolio of evidence showing that they have met all of the assessment objectives.

Portfolios of work must be produced independently. They will need to be made available, together with witness statements and any other supporting documentation, to the OCR Visiting Moderator when required.

Centres must confirm to OCR that the evidence produced by candidates is authentic. An OCR Centre Authentication Form is provided in the Centre Handbook and includes a declaration for assessors to sign. It is a requirement of the QCA Common Criteria for all Qualifications that proof of authentication is received.

Guidance on assessment and evidence requirements

An OCR model assignment is available for this unit and can be downloaded from our website: www.ocr.org.uk .

Candidates may provide portfolio evidence for this unit using a range of suitable and appropriate techniques which may include written data along with printouts and screen shots, annotated where necessary to explain what is being shown. Where evidence cannot be easily included within the portfolio, assessor testimony/witness statements must be included, signed by the assessor(s), and supported by appropriate evidence.

The assessment objectives for this unit cannot be achieved without designing and creating a relational database. Suitable relational database software must be provided by the centre to allow candidates to do this.

For Assessment Objective 1, candidates must provide details of the design of their relational database, including details of the purpose and audience of the database. For each table, candidates must indicate the table structure and relationships to be created. Validation, in the form of combo boxes, validation rules and input masks, is required beyond Pass level. Data entry forms must be used at all levels, but at Pass level, the wizard and a standard template can be used for at least one table. Higher level students may want to customise their forms, adding increased functionality etc. At Pass level, not all design choices have to be appropriate; they must, however, allow the database to function in order to achieve all the other assessment objectives.

For Assessment Objective 2, candidates must produce a functional relational database they have designed. At least 20 records must be added to each table. All candidates will use at least one form to enter data. At Pass level, the final database might not match the designs, but will still reflect them. At higher levels, designs and the actual implementation must be clearly linked.

For Assessment Objective 3, candidates will perform a range of sorts and queries. As a minimum candidates must describe the purpose of the queries used. Higher level candidates must explain or

justify their choice of queries. At Pass level, some of the queries and sorts performed might not be appropriate in terms of what is being found out. Screen shots of both design and output of the queries must be provided by the candidate.

For Assessment Objective 4, candidates will use the software to produce reports for each sort and query undertaken for Assessment Objective 3. At Pass level, candidates can simply use standard templates provided. Beyond Pass level, candidates will need to demonstrate that they can customise existing templates or create their own.

Assessment Objective 5 requires candidates to implement a user interface, giving the user access to various parts of the database. This could take the form of a switchboard or customised form, making use of a range of macros.

Assessment Objective 6 requires candidates to produce a test plan. They should carry out the tests and evidence this through a completed test plan or via a checklist. Candidates do not need to provide screenshots showing the actual tests being carried out. If the tests flag up any issues concerning the functionality of the candidates' database then it is expected that they will make the necessary changes.

Signposting to Key Skills

✓ The unit contains opportunities for developing the Key Skill, and possibly for generating portfolio evidence, if teaching and learning is focused on that aim.

Key Skill reference		**Key Skill reference**		**Key Skill reference**	
C2.1a		ICT2.1	✓	N2.1	✓
C2.1b		ICT2.2	✓	N2.2	
C2.2	✓	ICT2.3	✓	N2.3	
C2.3	✓				

Mapping to National Occupational Standards

National Occupational Standards	**Reference ID**	**Title**
IT Users (e-skills UK)	DB1/2/3	Database Software Levels 1/2/3
IT Practitioners and Professionals (e-skills UK)	ITPDADSD	Data Analysis and Data Structure Design

Resources

This section provides suggestions of suitable resources. The list is neither prescriptive nor exhaustive, and candidates should be encouraged to gather information from a variety of sources. Some suggested resources are intended for Tutor use. The resources in this section were correct at the time of production.

Books

F.R. Heathcote (2002) *Basic Access 2000-2003 & Teachers Book* Payne Gallway

F.R. Heathcote (2003) *Further Access 2000-2003 & Teacher resources* Payne Gallway

Wischhusen et al (2003)	Applied Information and Communication Technology for OCR Heinemann
Doyle S. (2002)	*Applied ICT* Nelson Thornes
Oppel A. (2004)	*Databases Demystified* McGraw-Hill Education
Warrender R.L. (2004)	*Databases* Learning Matters
(2004)	*ECDL/ICDL Made Simple* Butterworth-Heinemann
R.S.U. Heathcote (2000)	*Successful ICT Projects in Access* Payne Gallway
Doyle S. (2001)	*Information Systems for You Third edition* Nelson Thornes
Wischhusen et al (2000)	*Intermediate Information and Communication Technology* Heinemann
Steve Cushing (2002)	*GCSE ICT for OCR* Heinemann

Websites

http://www.isforyou.co.uk/
A site containing suggested answers for all chapters in Information Systems for You – Third edition publishes by Nelson Thornes Ltd

http://www.theteacher99.btinternet.co.uk/theteacher/gcse/newgcse/module5/task1.htm
Teacher and revision notes

http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuZnVsbHZpZXc%3D&resourceId=11572
A database of resources and activities created by teachers

http://www.bbc.co.uk/schools/gcsebitesize/ict/databases/index.shtml
A secondary revision resource for GCSe exams

http://www.geekgirls.com/menu_databases.htm
Provides a step-by-step guide to using databases

http://www.school-resources.co.uk/Coursework.htm
Provides education information, resources and ICT for teachers and students

Grading

Assessment Objective	Pass	Merit	Distinction
AO1 Design a relational database to meet the needs of an organisation	Candidates will produce a basic design for a relational database in line with identified user requirements. The design will include basic details of: table structures, primary keys, field names, field types, field lengths, relationships and at least one form template. Not all choices will be appropriate.	Candidates will produce a design for a relational database in line with identified user requirements. The design will include details of: table structures, primary keys, field names, field types, field lengths, combo boxes and validation rules, relationships and forms for each table. Most choices will be appropriate.	Candidates will produce detailed designs for a relational database in line with identified user requirements. The design will include comprehensive details of: table structures, primary keys, field names, field types, field lengths, combo boxes, validation rules and at least one input mask, relationships and custom forms for each table. All choices will be appropriate.
AO2 Construct the database according to the design	Candidates will construct a **functional** relational database with a minimum of 20 records in each table. A form will be used to enter data in one table. The database will mostly reflect the design work undertaken.	Candidates will construct a **functional** relational database with a minimum of 20 records in each table. Forms will be used to enter appropriate data in each table. The database will reflect the design work undertaken.	Candidates will construct a **functional** relational database with a minimum of 20 records in each table. Custom forms will be used to enter appropriate data in each table. The database will match exactly the design work undertaken.
AO3 Interrogate the database	Candidates will sort one table, carry out one query using simple criteria and one query using multiple criteria on linked tables. Purpose of queries will be described. Some queries produced may not be appropriate.	Candidates will perform a sort on one table, a sort on more than one field, carry out one query using multiple criteria and one query using complex criteria on linked tables. Range of queries used will be explained. The queries produced will all be appropriate.	Candidates will perform a sort on one table, a sort on more than one field, carry out one query using multiple criteria and two queries using complex criteria on linked tables. Range of queries used will be fully justified. All queries produced will be appropriate.

Assessment Objective	Pass	Merit	Distinction
AO4 Create reports	Candidates will produce a report for each sort and query, using a range of standard templates.	Candidates will produce an appropriate report for each sort and query, using at least one custom report.	Candidates will produce an appropriate report for each sort and query, using a range of different custom reports.
AO5 Create a user interface	Candidates will implement a limited user interface, giving access to some of the main areas of the database.	Candidates will implement a clearly-structured user interface, giving access to the main areas of the database.	Candidates will implement a fully-customised and easy-to-use user interface, giving access to the main areas of the database.
AO6 Test the database	Candidates will provide evidence of some testing. Candidates will make improvements to the functionality of their database **if** issues are identified through the tests they have carried out.	Candidates will provide evidence of testing most of the main areas of the database. Candidates will make improvements to the functionality of their database **if** issues are identified through the tests they have carried out.	Candidates will provide evidence of testing all the main areas of the database. Candidates will make improvements to the functionality of their database **if** issues are identified through the tests they have carried out.