



ICA10105  
Certificate I in Information Technology

**ICAU1131B**

## **Operate a Database Application**

**(35hrs)**



## ICAU1131B: Operate a Database Application

### Description

This unit defines the competency required to operate database applications and perform basic operations. The following units are linked and form an appropriate cluster:

**ICAU1128B** Operate a personal computer

**ICAU1129B** Operate a word processing application

**ICAU1130B** Operate a spreadsheet application

**ICAU1132B** Operate a presentation package

*(No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.)*

### Employability Skills

This unit contains employability skills.

### Unit Sector

Use

### Performance Criteria

<b>Element</b>	<b>Performance Criteria</b>
<u>1. Create database</u>	<u>1.1 Open a database application and design a two-table simple relational database incorporating basic <b>designprinciples</b></u>
	<u>1.2 Develop a table with fields and <b>attributes</b> according to database usage, as well as user requirements</u>
	<u>1.3 Create a primary key and establish an index for each table</u>
	<u>1.4 Modify table layout and field <b>attributes</b> as required</u>
	<u>1.5 Create a <b>relationship</b> between the two tables</u>

1.6 Add and modify data in a table according to information requirements

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1.7 Add and delete records as required

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1.8 Save and close down database to **disk**

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2. Customise basic settings

2.1 Adjust page layout to meet user requirements

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2.2 Open and view different **toolbars**

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2.3 Format **font** as appropriate for the purpose of the database entries

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3. Create reports

3.1 Design reports to present data in a logical sequence

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3.2 Modify reports to include/exclude additional requirements

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3.3 Distribute reports to **appropriate person** in a suitable format

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4. Create forms

4.1 Use a wizard to create a simple form

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4.2 Open existing database and modify records through a simple form

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4.3 Rearrange **objects** within the form to accommodate information requirements

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5. Retrieve information

5.1 Access existing database and locate required records

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5.2 Create simple query and retrieve required information

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5.3 Develop query with multiple criteria and retrieve required information

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5.4 Select data and display appropriately

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## Skills and Knowledge

### Required skills

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- Reading and writing at a level where basic workplace documents are understood
  - Clear and precise communication
  - Interpretation of user manuals
  - Ability to create a simple database
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### Required knowledge

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- Basic database design
  - Knowledge of relationships between tables (cardinality)
  - Knowledge of forms, reports and queries for retrieving and displaying information
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## Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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**Design principles** may include: \_\_\_\_\_

- naming conventions
- data layout
- formatting

**Attributes** may include: \_\_\_\_\_

- name
- data type
- size

**Relationship** may be but is not limited to: \_\_\_\_\_

- one-to-one
- one-to-many
- many-to-many relationships

**Disk** may include but are not limited to: \_\_\_\_\_

- diskettes (floppy disks)
- CDs
- CD-RW (Compact Discs-Read Write)
- DVD RW
- zip disks
- solid state hard drives

**Page layout** may include: \_\_\_\_\_

- landscape
- portrait

**Toolbars** may contain: \_\_\_\_\_

- buttons
- menus
- a combination of both

**Font** \_\_\_\_\_

- The combination of typeface and other attributes, such as size, pitch, and spacing character or symbol

**Appropriate person** may include: \_\_\_\_\_

- supervisor
- teacher
- authorised business representative

Objects may include:

- client
- buttons
- checkboxes
- option buttons
- text boxes
- drop down lists

## Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

### Overview of assessment

### Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the following is essential:

- Assessment must ensure a person has the ability to design and develop a simple database using a standard database package. The person must add data, use queries, and create forms and reports.

To demonstrate competency in this unit the person will require access to:

- Personal computer
- Basic software
- Documents or information containing data suitable for creating a database

### Context of and specific resources for assessment

An individual demonstrating these competencies, may use pre-existing data (e.g. documents, spreadsheet data, data from database tables) or create new data when creating and manipulating databases and tables.

The breadth, depth and complexity of knowledge and skills in this competency would prepare a person to perform a defined range of activities many of which may be routine and predictable.

- Assessment must ensure

Applications may include a variety of employment related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group.

### **Method of assessment**

The purpose of this unit is to define the standard of performance to be achieved in the workplace. In undertaking training and assessment activities related to this unit, consideration should be given to the implementation of appropriate diversity and accessibility practices in order to accommodate people who may have special needs. Additional guidance on these and related matters is provided in ICA05 Section 1.

- Competency in this unit should be assessed using summative assessment to ensure consistency of performance in a range of contexts. This unit can be assessed either in the workplace or in a simulated environment. However, simulated activities must closely reflect the workplace to enable full demonstration of competency.
- Assessment will usually include observation of real or simulated work processes and procedures and/or performance in a project context as well as questioning on underpinning knowledge and skills. The questioning of team members, supervisors, subordinates, peers and clients where appropriate may provide valuable input to the assessment process. The interdependence of units for assessment purposes may vary with the particular project or scenario.

### **Guidance information for assessment**

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICAU1128B Operate a personal computer
- ICAU1129B Operate a word processing application
- ICAU1130B Operate a spreadsheet application
- ICAU1132B Operate a presentation package

An individual demonstrating this competency would be able to:

- Demonstrate knowledge by recall in a narrow range

of areas

- Demonstrate basic practical skills, such as the use of relevant tools
  - Perform a sequence of routine tasks given clear direction
  - Receive and pass on messages and information
  - Maintain knowledge of industry products and services
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*Lets get started...*

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## ICAU1131A – Operate a Database Application

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Activity:

### Create a Database

This activity can also be used for ICAU1204B - Locate and use relevant online information.

In this activity you will address the following elements from ICAU1131B - Operate database applications:

- Create a database
- Customise basic settings
- Create reports
- Create forms
- Retrieve information

Using a search engine search online for at least 8 **businesses** that you consider you would like to work for.

Keep records of the following:

- Business name
- Address
- Phone number
- Email
- Web address

Create a second table called **Job Hunting**. You will use this to keep records of contacts you have with employers in your Job search. Create a table that includes:

- Phone number
- Contact name
- Contact type You are going to enter cold call, letter, email or phone as your options in this field
- Contact date
- Contact outcome

Create a relationship between the two tables using the phone number.

1. Create forms to enter data into the database.
2. Create a simple query that lists the employers you have sent letters to
3. Design a report to list the number of employers you have had contact with



**ICAU1131A Operate a database application |  
Create multiple table relational databases**

## **Builder's Friend**

The Builder's Friend hardware store is an old family based company that currently uses a paper-based recording system for all aspects of its business.

They have made the decision to change to a computerised database system and as the first part of this process want to create tables and enter the data to hold current hire items and supplier details.

Currently details for each product made available to for sale are stored in a filing cabinet holding folders labelled with each letter of the alphabet. Each folder contains a brochure or sheet of paper for each product whose name starts with that letter and of the supplier of that item. Where product names differ only slightly and come from the same supplier, such as 25mm nails and 50mm nails, details of all are recorded on a single sheet. Each product is always purchased from only one supplier but each supplier can supply more than one product.

Current information stored for each separate product in the paper based system is:

- product name
- date of last purchased
- last purchase price
- quantity purchased
- last stocktake number
- retail price (160% of the 'Last purchase price').
- supplier address
- supplier phone no
- supplier fax no
- supplier email address
- supplier name

A requirement of the new computer based system is that similar items, such as 25mm nails and 50mm nails, are to have separate records. Also the 'Last stocktake number' is to be replaced by a 'Number in stock' item that will eventually be automatically updated as a sale is made.

You are asked to design and create a two-table relational database for this company that will keep track of products and suppliers. Include artificial keys where considered appropriate. To test the operation of the database tables, enter details for at least ten products and five suppliers.

Save the file as 'builders\_friend' in a folder called 'Databases' where you normally save your work.



## ICAU113B – Operate a Database Application

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### ACTIVITY:

### Database Quiz

Select the best answer to the question.

1. What is a database?
  - An organised collection of related records which can have multiple uses
  - A place to keep your notes
  - Information on a topic
  - Anything that stores information
2. Which of the following is NOT an example of a database?
  - Telephone book
  - MYOB accounting
  - Microsoft Outlook
  - All of the above are databases
3. Select the INCORRECT statement about common types of databases.
  - An example of a Relational Database is Microsoft Access
  - An example of a Horizontal Database is Google Earth
  - An example of a Flat File Database is Microsoft Excel
  - An example of a Hierarchial Database is Encarta Encyclopedia
4. Database entry
  - Needs to be accurate
  - Cannot be entered incorrectly as the system autocorrects
  - Is always entered by the one person
5. Databases are made up of:
  - Diagrams
  - Tables
  - Forms
  - Flowcharts

6. Page layout in a database is always:
- Portrait
  - Landscape
  - Either of the above
  - Neither of the above
7. A query is
- A question that you ask about the information
  - A way of extracting information from the tables in a database
  - A complex process that a web designer creates for online databases
  - All of the above
8. Relationships in a database are:
- Connections between the tables
  - Reports queries and attributes of the database
  - Places where data is stored

END OF QUIZ.



## ICAU113B – Operating a Database Application

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### Databases

Good database design ensures that your database is easy to maintain. You store data in tables and each table contains data about only one subject, such as customers. Therefore, you update a particular piece of data, such as an address, in just one place and that change automatically appears throughout the database.

A well-designed database usually contains different types of queries that show the information you need. A query might show a subset of data, such as all customers in London, or combinations of data from different tables, such as order information combined with customer information.

Customers : Table		
Customer ID	Company Name	City
BSBE V	B's Beverages	London
EAST C	Eastern Connection	London
HANAR	Hanari Carnes	Rio de Janeiro

Orders : Table		
Order ID	Required Date	Customer ID
10331	21-Apr	HANAR
10343	05-Apr	BSBE V
10367	25-Apr	EAST C

London Orders for April : Select Query			
Order ID	Required Date	Company Name	City
10343	05-Apr	B's Beverages	London
10367	25-Apr	Eastern Connection	London

**1** This query retrieves the order ID, company name, city, and required date information for customers in London whose orders were required in April.

The results you want from your database—the forms and you want to use, and the reports you want to print— don't necessarily provide clues about how you should structure the tables in your database, because you often base forms, reports, and data access pages on queries instead of tables.

Before you use Microsoft Access to actually build tables, queries, forms, and other objects, it's a good idea to sketch out and rework your design on paper first. You can also examine well-designed databases similar to the one you are designing, or you can open the *Northwind* sample database and then open the database to examine its design.

Follow these basic steps when designing your database.

⊕ Determine the purpose of your database:

- *Talk to people who will use the database. Brainstorm about the questions you and they would like the database to answer.*
- *Sketch out the reports you'd like the database to produce.*
- *Gather the forms you currently use to record your data.*

⊕ Determine the fields you need in the database:

*Each field is a fact about a particular subject. For example, you might need to store the following facts about your customers: company name, address, city, state, and phone number. You need to create a separate field for each of these facts. When determining which fields you need, keep these design principles in mind:*

- *Include all of the information you will need.*
- *Store information in the smallest logical parts. For example, employee names are often split into two fields, First Name and Last Name, so that it's easy to sort data by Last Name.*
- *Don't create fields for data that consists of lists of multiple items. For example, in a Suppliers table, if you create a Products field that contains a comma-separated list of each product you receive from the supplier, it will be more difficult to find only the suppliers that provide a particular product.*
- *Don't include derived or calculated data (data that is the result of an. For example, if you have a Unit Price field and a Quantity field, don't create an additional field that multiplies the values in these two fields.*
- *Don't create fields that are similar to each other. For example, in a Suppliers table, if you create the fields Product1, Product2, and Product3, it will be more difficult to find all suppliers who provide a particular product. Also, you will have to change the design of your database if a supplier provides more than three products. You need only one field for products if you put that field in the Products table instead of in the Suppliers table.*

+ Determine the tables you need in the database.

+ Determine which table each field belongs to.

When you decide which table each field belongs to, keep these design principles in mind:

- *Add the field to only one table.*
- *Don't add the field to a table if it will result in the same information appearing in multiple records in that table. If you determine that a field in a table will contain a lot of duplicate information, that field is probably in the wrong table.*
- *For example, if you put the field containing the address of a customer in the Orders table, that information will probably be repeated in more than one record, because the customer will probably place more than one order. However, if you put the address field in the Customers table, it will appear only once. In this respect, a table in a Microsoft Access Database differs from a table in a flat file database such as a spreadsheet.*

When each piece of information is stored only once, you update it in one place. This is more efficient, and it also eliminates the possibility of duplicate entries that contain different information.

+ *Identify the field or fields with unique values in each record.*

+ *Refine your design.*

+ *Enter data and create other database objects.*

+ *Use Microsoft Access analysis tools.*

## Introduction to Access 2003

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Access 2003 is a powerful, yet simple to use database package. This chapter explains what a database is and what features make Access so popular. You'll get a guided tour of the Access main screen; learn how to open and close an existing database and get help when you need it. We'll look at Microsoft's sample *Northwind* database which you can use to practise what you read in this book without worrying about damaging your own data. We'll also cover the main building blocks of an Access database: Tables, Queries, Forms and Reports.



### What is a Database?

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#### **Definition:**

A database is an organized collection of information. Examples of databases include a telephone directory and a filing cabinet full of employee records. The trouble with these databases is that their organization is inflexible. When you want to search for a specific item of information, your search needs to follow the ordering of the data. For instance, a TV Guide is a very simple example of a database, storing information about television programs organized by the date and time they are due to be broadcast. If you're looking for a particular program and you don't know when it's on then you'll have to start on day one and search systematically through all the entries for that day, from the earliest to the latest. If you don't find it there, you'll have to proceed to day two and continue your search until you either locate the program, or come to the end of the guide! Wouldn't it be much simpler if you could sort the data, so that all programs were listed alphabetically by name? With a printed database like the TV Guide, the only way to do this is to grab your scissors and start cutting!

#### **Computer Databases**

Now consider a bank's database. This will likely contain records for hundreds of thousands of customers. Not just their contact details, but all the accounts they hold with the bank and the various transactions going through them. If a customer raises a query about one particular transaction then the bank's staff need to be able to locate it quickly. They will also want to select customers according to certain criteria for marketing purposes, offering them other products like loans and credit cards. Clearly a manual system would not be adequate for the bank's purpose and in fact banks use huge and sophisticated computer databases which allow them to locate individual transactions among millions within seconds. Today, when we talk about databases we are usually referring to databases held on computers. Because of their large storage capacities and ability to manipulate large amounts of data quicker than we could ever do manually, they are ideally suited to this task.



## How Data is Stored

A computer database holds information in tables, which contain records comprised of fields. If we used Access to create a TV Guide database, then the Scheduled Listings table might look like this:

*Records are sometimes called "rows" or "observations".*

*Fields are sometimes called "columns" or "variables".*

The columns are the table's *fields*. The rows are the table's *records*.

## Tables

A table is a collection of data about similar items. This table contains information about scheduled television programs.

## Records

A record is the data pertaining to one particular item. This record contains information about the "False Chances" program.

## Fields

A field is one specific piece of information about a record, in this case it's the Channel field, telling us that "False Chances" will be showing on the "Family Faves" channel.

## Relationships Between Tables

Certain databases support the creation of logical links (or relationships) between the tables. This type of database is called a relational database. It enables information to be manipulated and presented to the user in many different ways without affecting the underlying data.

We'll learn about relational databases in the next topic.

## What is a Relational Database?

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A relational database system stores related data in separate tables. The bank for example, will keep customer contact information in one table and account and transaction data in others. By defining the relationships between these tables you can retrieve the data and use it for making queries and writing reports. Data in a relational database can be sorted and the order of fields rearranged without affecting the actual data. Going back to our TV guide example, if the program details were stored in a relational database, we would be able to:

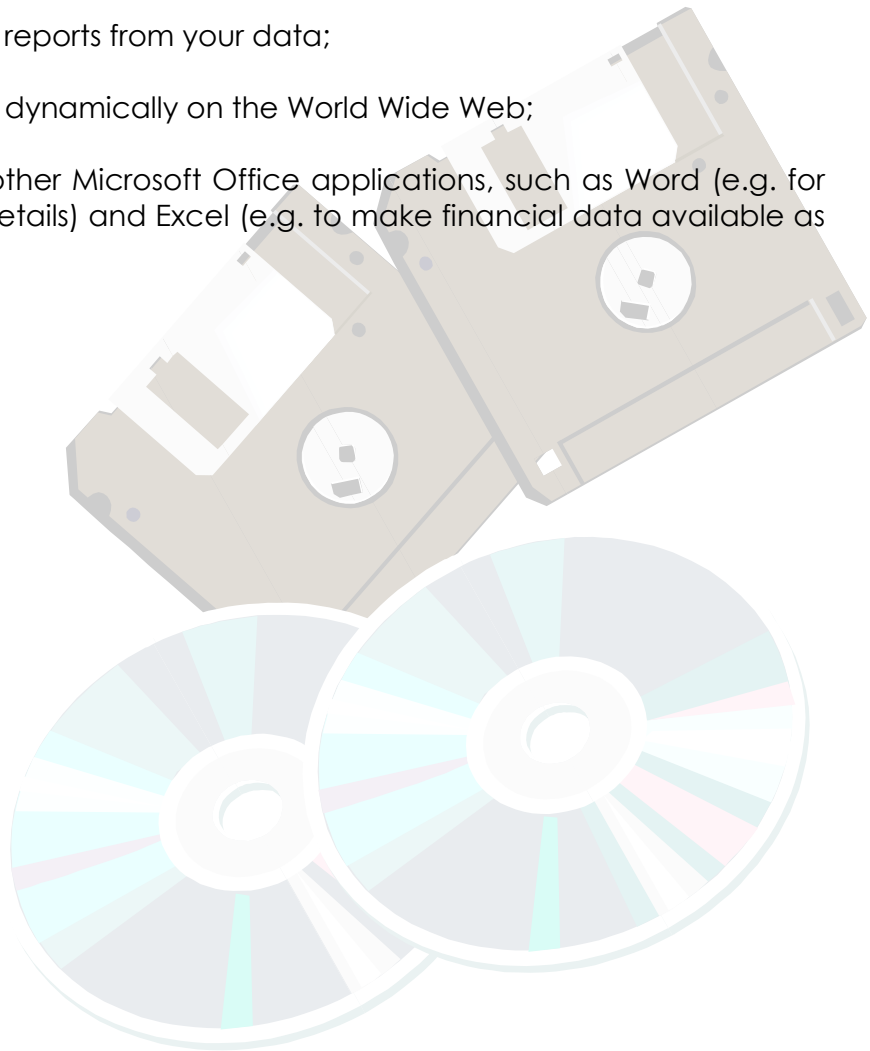
- Search the Program Type field to see all the children's programs;
- Search the Program Type and Date fields to list all the movies showing on Wednesday;
- A TV Guide is a trivial example. But in a database containing many thousands or even millions of records the ability to manipulate the data in this way is vital;
- Link to the Actors table, to see which actors starred in the film "Bridges Too Far".

## Why Use Microsoft Access?

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Purists would argue that Access is not a relational database. Whether it is or not isn't important for our purposes, because Access includes many of the features found in "real" relational database packages at a fraction of their cost. And unlike most of them, the Access implementation is extremely easy to use. Access is a simple yet sophisticated tool that makes storing, organizing and sharing your data a snap. Access lets you:

- Create sophisticated databases quickly;
- Analyse and modify your data easily with queries;
- Build forms which allow you to present your data in a format which is easy to read and allows for simple and accurate data entry;
- Create elaborate reports from your data;
- Present your data dynamically on the World Wide Web;
- Share data with other Microsoft Office applications, such as Word (e.g. for mailing address details) and Excel (e.g. to make financial data available as a spreadsheet).





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### Peer assessment for database creation

Name of candidate \_\_\_\_\_

Date \_\_\_\_\_

Name of peer assessor \_\_\_\_\_

Observe a demonstration of the creation of a simple relational database including two tables, and tick off the function as it is demonstrated by the candidate:

**Did the learner** (tick if demonstrated):

- Open a database application
- Create two tables with appropriate fields and attributes
- Create primary keys
- Create relationships between the tables
- Create a form using a wizard
- Input data into the table using the form
- Create a query to extract specific data from the database
- Add and delete records
- Create a report to present data in a logical sequence
- Save a copy of the database to a disk or USB

**Comment:**

An aspect of the demonstration that was done really well was:


An aspect of the demonstration that could be improved was:
