

Course  
**CMP-5071-2**  
Operating a Database

Computer Science





## INTRODUCTION

The goal of the *Operating a Database* course is to help adult learners acquire a general understanding of the main concepts related to searching and modifying databases.

In this course, adult learners deal with various learning situations that help them acquire practical knowledge about databases while discovering what computers can do. By creating queries and reports and modifying data in a table, adults ensure that they put into context the information gathered. Throughout the learning process, they evaluate their work while making sure they have met the standards that have been set.

By the end of this course, adult learners will be able to understand the principles associated with operating a database, create and modify queries and reports according to specific instructions, and recognize the role of objects in a database. They will be able to use help and support tools when operating a database.

## SUBJECT-SPECIFIC COMPETENCIES

This course targets the following subject-specific competencies:

- *Interacts in a computer environment*
- *Produces computerized documents*
- *Adopts behaviours that reflect a concern for ethics, safety and critical thinking*

Thus, it is by activating and integrating all three subject-specific competencies and by using other resources that adults are able to effectively structure their learning.

During the learning situations, adult learners use the resources of a software program and a computer network. They carefully plan their work and adapt their plan as they work. As they carry out a project and upon its completion, they evaluate their efficiency and make any necessary adjustments to their approach.

## PROCESSES AND STRATEGIES

As they learn about computers, adult learners are called upon to use various processes and strategies. These processes and strategies represent the way in which adults go about solving problems, meeting challenges and, in general, carrying out their learning activities.

For the *Operating a Database* course, the suggested approach is the familiarization process.

Familiarization process	
<ul style="list-style-type: none"> <li>• This process involves becoming familiar with the basics of a computer application.</li> <li>• Adult learners familiarize themselves with the main concepts and develop an overall understanding of the application.</li> <li>• The goal of this process is not to be able to produce documents quickly, efficiently and without errors, but rather to understand as clearly as possible the logic behind the application.</li> </ul>	
<b>Examples of strategies</b>	<ul style="list-style-type: none"> <li>- Determining the necessary resources</li> <li>- Taking stock of their ability to interact in a computer environment</li> <li>- Comparing the current situation with the desired situation</li> <li>- Adhering to the plan</li> <li>- Making adjustments to the plan as they work</li> <li>- Determining the improvements to be made and the means of doing so</li> </ul>

To meet the requirements of the familiarization process, adult learners take stock of what they already know and try to apply that knowledge to the object or situation they are learning about. Their plan must therefore be flexible and include help resources so that they can make adjustments throughout the process.

## CROSS-CURRICULAR COMPETENCIES

The cross-curricular competencies are not developed in a vacuum; they are rooted in learning situations and contribute, to varying degrees, to the development of the subject-specific competencies, and vice versa.

Several cross-curricular competencies can be useful in dealing with the learning situations in the *Operating a Database* course. Two are considered particularly relevant to this course: *Uses information and communications technologies* and *Adopts effective work methods*.

### ▪ Methodological Competencies

Databases play an important role in nearly all computer applications. By familiarizing themselves with the main elements of databases, adult learners develop the competency *Uses information and communications technologies*. They understand how data is stored and how it can be used.

To search a database and modify its main objects, adult learners must *adopt effective work methods*. This requires having an overall view of all the steps involved in their work and using rigour at every step.

## SUBJECT-SPECIFIC CONTENT

The subject-specific content consists of knowledge and cultural references. The prescribed content for this course is outlined below. However, depending on the context (e.g. if certain tools or functions are not available in a given software program), other equivalent content may be substituted for that outlined below.

## KNOWLEDGE

- ***Nature, role and properties of the main objects of a database***
  - Table
  - Record
  - Field
  - Primary key
  - Queries
  - Selection (sort, filter, without criteria)
  - Simple query, single criterion query, use of logic operators (< = >)
  - Complex query, multiple criteria query, use of relational operators (**AND, OR**)
  - Reports
- ***Main databases***
  - Database management systems (DBMS)
  - Internet search engines
- ***Standard terminology associated with databases***
- ***Translating a question from everyday language into database language***
- ***Using an existing database***
  - Using queries
  - Using reports
  - Adding, deleting and changing data in a table
- ***Creating and modifying data***
  - Queries
  - Single criterion query
  - Multiple criteria query
  - Calculated field

- Reports
- Grouping levels
- Formatting results

## CULTURAL REFERENCES

The following cultural references will help adults understand some of the factors that influenced the development of computers. These references give a cultural dimension to instruction, expand the adult learners' knowledge and make their learning meaningful. The teacher, with input from adult learners, may choose other references that are more appropriate to the task at hand.

- **Events and chronology**
  - Common uses of databases
    - Electoral lists
    - Civil and criminal records
    - Library catalogues
  - Explosion of identity theft
  - Call lists
  - Class lists
- **Heritage objects**
  - Internet search engines
  - List of personal contacts
  - Old mail-order catalogues
- **Regional or national references**
  - Employers, inventory, payroll management
  - Anecdotes
  - School-related elements

## FAMILIES OF LEARNING SITUATIONS

The goal of the *Operating a Database* course is to help adult learners acquire a general understanding of the main concepts related to searching and modifying databases. This course gives adult learners the opportunity to perform actions that will enable them to interact in a computer environment and produce quality computerized documents.

The shaded cells in the table below provide specifics about the contexts in which the prescribed families of learning situations are applied in this course.

Subject-specific competencies	Families of learning situations related to . . .		
	Information	Creation	Critical thinking
Interacts in a computer environment	Interacts by interpreting signals he/she receives and using input and output peripherals	Discovers what computers can do by consulting documentation and by experimenting	Critically examines computerized communication tools by applying evaluation criteria
Produces computerized documents	Communicates by using computerized services	Creates by correctly using the appropriate functions	Evaluates his/her work by setting quality standards
Adopts behaviours that reflect a concern for ethics, safety and critical thinking	Communicates respectfully, using the conventions of a given medium	Acts prudently by adopting safe behaviours	Validates information by using validation criteria

First, adult learners discover what computers can do by consulting documentation and by experimenting.

Then, they create queries and reports by correctly using the appropriate functions and thus work more efficiently. They make sure they act prudently by adopting safe behaviours in order to avoid errors, and regularly evaluate their work in order to make the necessary adjustments. They validate information using criteria that puts the information in context.

## BROAD AREAS OF LEARNING

The broad areas of learning deal with major contemporary issues. Ideally, the situations to be studied should be selected in keeping with the educational aims of the broad areas of learning, since these areas of learning provide a broader context for the learning situations and thus serve to make learning more meaningful. Two broad areas of learning are considered particularly relevant to this course: Environmental Awareness and Consumer Rights and Responsibilities, and Citizenship and Community Life.

### ■ Environmental Awareness and Consumer Rights and Responsibilities

Learning how to develop an active relationship with his or her surroundings while maintaining a critical attitude toward consumption and the exploitation of the environment is an essential part of an adult's education. A learning activity that enables adult learners to become aware of the importance of databases in marketing meets the educational aim of the BAL Environmental Awareness and Consumer Rights and Responsibilities.

## ■ Citizenship and Community Life

The Computer Science program gives adult learners the opportunity to experience the principles that are the basis of equal rights in our society. A learning situation that makes adult learners aware of database-related errors and fraud meets the educational aim of the BAL Citizenship and Community Life.

### EXAMPLE OF A LEARNING SITUATION

All learning situations, no matter what broad area of learning is targeted, place adult learners at the heart of the action. Learning situations promote the development of subject-specific and cross-curricular competencies, the acquisition of computer knowledge and skills and the mobilization of various resources that are useful in carrying out the tasks at hand.

The table below shows the elements that need to be considered when developing learning situations and highlights those used in the learning activity described on the following page.

ELEMENTS REQUIRED IN LEARNING SITUATIONS	
<b>Broad area of learning</b> (targeted) - Contextualizes learning to make learning more meaningful	<ul style="list-style-type: none"> <li>• Citizenship and Community Life</li> </ul>
<b>Subject-specific competencies</b> (prescribed) - Are developed in action and require the active participation of adult learners	<ul style="list-style-type: none"> <li>• Interacts in a computer environment</li> <li>• Produces computerized documents</li> <li>• Adopts behaviours that reflect a concern for ethics, safety and critical thinking</li> </ul>
<b>Families of learning situations</b> (prescribed) - Group together situations appropriate to the course, based on issues drawn from reality - Promote the acquisition of computer knowledge and skills	<ul style="list-style-type: none"> <li>• <b>Creation</b> <ul style="list-style-type: none"> <li>○ Discovers what computers can do</li> <li>○ Creates by correctly using the appropriate functions</li> <li>○ Acts prudently by adopting safe behaviours</li> </ul> </li> <li>• <b>Critical thinking</b> <ul style="list-style-type: none"> <li>○ Evaluates his/her work by setting quality standards</li> <li>○ Validates information by using validation criteria</li> </ul> </li> </ul>
<b>Cross-curricular competencies</b> (targeted) - Are developed in context together with the subject-specific competencies	<ul style="list-style-type: none"> <li>• Uses information and communications technologies</li> <li>• Adopts effective work methods</li> </ul>
<b>Knowledge</b> (prescribed) - Includes computer knowledge and skills that adult learners must acquire in the course	<ul style="list-style-type: none"> <li>• Consulting an existing database by creating simple or complex queries and presenting results in a report</li> </ul>



This section provides an example of a learning activity. It includes a context that serves as a common thread throughout the activity; however, it is not formally spelled out. Although they may not be explicit, the learning situation includes the elements identified in the previous table: the broad area of learning, the subject-specific competencies, the families of learning situations, the cross-curricular competencies and the prescribed knowledge. To promote learning, these elements must be structured in a coherent and meaningful way.

Teachers can target any element as a focus of learning, be it actions related to the subject-specific or the cross-curricular competencies or the prescribed knowledge that adults must acquire.

### EXAMPLE OF A LEARNING SITUATION

#### School library

**Task:** Update the database of the adult education centre's library by creating new queries and reports.

To start off the activity, adult learners meet with the person in charge of the library, who gives them a list of the most frequently requested books and types of books in the library.

To carry out the activity, adult learners refer to the list and create the required queries and reports to make it easier to search for the most popular books.

At the end of the activity, adult learners ask some of their classmates, the teacher and the person in charge of the library to test the queries created. They identify possible errors and make the necessary corrections.

### END-OF-COURSE OUTCOMES

To deal with situations related to operating a database, adult learners search a database by creating queries and generating results in reports. They modify the content of a table by adding, deleting and modifying certain data. To do this, they use the following subject-specific competencies: *Interacts in a computer environment*, *Produces computerized documents* and *Adopts behaviours that reflect a concern for ethics, safety and critical thinking*.

Thus, when adult learners *discover what computers can do*, they consult the documentation provided in order to define the context, and experiment in order to analyze the situation. This helps them determine the possibilities offered by databases as well as the consequences and risks associated with their actions.

When adult learners *create*, they consider all aspects of a task, plan it and evaluate its complexity. They respect the constraints of databases as they create queries, forms and reports. They also create, delete or modify data. Thus, they adopt a flexible approach by identifying successful strategies, and review the steps followed and the results obtained.

When adult learners *act prudently*, they *adopt effective work methods* by determining the best way to proceed in order to avoid errors. They also make sure to put the information gathered in context.

When adult learners *validate information* obtained through database searches (e.g. queries, sorting, filtering or reports), they put the information in context by comparing it with the initial question in natural language. If necessary, they correct the search parameters and repeat the search.

Throughout the learning process, adult learners develop competence in the following computer knowledge and skills: they search an existing database, produce reports and modify data. In addition, adult learners do not hesitate to consult various resources to obtain help when difficulties arise.

## EVALUATION CRITERIA

### ***Interacts in a computer environment***

- Use of appropriate strategies to interact and to troubleshoot

### ***Produces computerized documents***

- Thorough planning of the work
- Appropriate formatting based on document type
- Application of appropriate tools and functions
- Rigorous compliance with the constraints identified

### ***Adopts behaviours that reflect a concern for ethics, safety and critical thinking***

- Appropriate adoption of ethical and safe behaviours
- Judicious integration of information in accordance with the constraints identified