LaSalle College
Montréal

COURSE OUTLINE

Course identification

Name of program – Code:	COMPUTER SCIENCE TECHNOLOGY - VIDEO GAME PROGRAMMING – 420.BX
Course title:	**DATABASES**
Course number:	420-BA3-AS
Total number of course hours:	90 Hours
Weighting:	3-3-2
Statement of the competencies – Codes:	Use a database management system- 00Q7 Evaluate software and hardware components - 00SF

Contribution of the course in the program

Course position

This course is located in the third semester of the *Computer Science technology- Video Game programming (*420-BX*).* Its duration is 90 hours divided into 45 hours of theory and 45 hours of exercises plus approximately 30 hours of homework.

It shares the development of 00Q7 competency with *Workplace Integration: programming in video games* (420-JST-AS), given in the sixth semester which completes its development and It also shares the development of 00SF competency with *Structured Programming* (420-P16-AS), given in the first semester and *Workplace Integration: programming in video games* (420-JST-AS) given in the sixth semester which completes its development. There are no prerequisites. It is a prerequisite to *Game Engine II* (420-JV9-AS) given in fourth semester and *Information System and Project Methodology II* (420-J12-AS) given in the sixth semester.

Scope of the course

During this course, the student learns how to manipulate data of the database using primarily Oracle database management system. First, he learns the fundamentals databases concepts with a focus on relational model. He learns to design an entity-relationship database diagram and convert it into a relational one. Then, he examines different ways to add, update, and search data using SQL language.

Upon completion of this course, the student will be able to design an entity-relationship database schema, to transform it into a normalized relational one and to examine its integrity constraints. He will also be able to implement a database, to modify its structure, to remove it, to backup and restore it. Moreover, he will be able to manipulate database data and display them using several search methods.

Course components (objective and standard of the competencies)

Expected outcomes (achievement context of the competencies)

The achievement context of these competencies will reflect the conditions as they occur in the following settings: academic, professional, work, or life environment.

Achievement context for the competency: Use a database management system – 00Q7:

- For a relational or other type of database management system
- Based on the data model and specifications of the database management system

Achievement context for the competency: Evaluate software and hardware components – 00SF:

- Using information sources
- Based on functional specifications and architecture diagrams
- Using technical documentation

Throughout the course, you will engage in various learning situations/activities so that by the end of the course, you will have met the expected outcomes.

Elements and performance criteria

The elements of an objective formulated in terms of the competency specify its essential components. They include only what is necessary in order to understand and master the competency. If the competency is described as a process, the elements are the steps for execution.

The performance criteria are the specific pre-established requirements upon which you and your teacher can objectively judge your development of the targeted competency. They are part of the description of this competency. They are prescriptive.

Sometimes an element appears in more than one course. If this is the case, a number indicates its complexity level: level one (1) being the simplest, level two (2), average, and level three (3), advanced, at the ministerial level.

Below are the elements of the competencies and performance criteria for this course that are to be respected:

Competency: Use a database management system - 00Q7 ***General ministerial and institutional performance criteria:*** – Autonomy – Critical thinking – Sense of organization	
Elements of the competency	***Performance criteria specific to each element***
1. Create the database.	1.1 Accurate analysis of the data model 1.2 Accurate analysis of the specifications of the database management system 1.3 Appropriate coding of the instructions for creating the database

2. Formulate read requests, insertion requests, modification requests and deletion requests.	2.1 Accurate identification of the types of requests to be formulated 2.2 Appropriate use of clauses, operators, commands and parameters 2.3 Appropriate use of regular expressions 2.4 Proper performance of requests
3. Ensure data confidentiality and consistency.	3.1 Accurate identification of the techniques to be used 3.2 Proper management of authorizations 3.3 Appropriate data encryption 3.4 Appropriate use of referential integrity constraints, triggers and transactions
4. Program automated data processing operations.	4.1 Accurate identification of data processing operations to be automated 4.2 Appropriate creation of stored procedures and scripts 4.3 Clear record of programming support documentation
5. Save and restore the database.	5.1 Astute choice of techniques to be used for saving and restoring 5.2 Appropriate use of techniques for saving and restoring the database 5.3 Compliance with the procedure and frequency for saving the database

Competency: Evaluate software and hardware components - 00SF

General ministerial and institutional performance criteria:

- Autonomy
- Critical thinking
- Sense of organization

Elements of the competency	***Performance criteria specific to each element***
2. Research software and hardware components.	2.1 Appropriate choice of information sources 2.2 Accurate inventory of the available software and hardware components

Course content/main themes

*Listed below is the **essential** content to be covered in this course:*

- Fundamental concepts of databases

- Design of the database
  - Normalization of relations, Entity-relationship diagram, converting an entity-relationship diagram to a relational schema
- Install and configure Oracle and SQLServer RDBMS.
- Integrated database environments
  - SQL*Plus, SQL*Developer, SQLServer Management Studio
- Data description language
  - Data types, type of objects and integrity constraints
  - Creating, altering and dropping tables
  - Creating, altering and dropping other database objects (indexes, sequences, synonyms and views)
  - Querying data dictionary
- Data manipulation language
  - Adding, updating and deleting data
- Data query language
  - Querying one table (using one or many criteria, sorting data, using mono and multiple row operators)
  - Joining tables (relational join, self-join, cross product, natural join, procedural join, correlated join, outer join)
  - Group functions (simple and advanced group functions, group functions and join)
  - Algebra operators
- Database backup and restore

Learning activities

Provided below are examples of learning activities that correspond to the competencies for this course. The learning activities are found in the course calendar that complements this course outline.

- Brain storming
- Application exercises following demonstrations from the teacher
- Case studies
- Project
- Situation problems
- Group discussion

Terms for Evaluating Learning

The evaluation of your learning is based on two inseparable methods: formative evaluation and summative evaluation. These two evaluation types are formal. Detailed information on the evaluation schedule is found in the course calendar, under the "Formative and summative evaluation schedule" column.

Formative evaluation

Following a learning activity or learning period, time is set aside for introspection. You will determine what has been understood and achieved and seek to identify the nature and origin of weak areas. These designated periods consist of simple means: short tests, association games, logbooks, a portfolio, questions, creating of samples, etc.

Formative evaluation is frequent and covers as many aspects as possible. It takes place in class, individually or in groups, and leads to immediate decisions. ***You are the one who assumes the bulk of the work during individual or group corrections, adjustments and other self-evaluation tasks. The purpose is not to determine grades.***

If you take the results of the formative evaluations seriously throughout the course, you will ensure preparedness for the summative evaluations. You will be able to make the necessary progress to acquire the targeted competency at the required level, according to the achievement context and pre-established performance criteria.

Below are some examples of formative evaluation methods that correspond to the targeted competencies for this course:

- Situation problems
- Case studies
- Feedback from the teacher after student's application exercises

Summative evaluation

Summative evaluations are less frequent. They take place later on, towards the middle and end of the semester. This gives you the time to integrate your learning and to learn how to apply it to situations related to the targeted competency. The summative evaluation material is prepared by your teacher according to the description of the course's targeted competency: its elements, achievement context and performance criteria.

The work completed in summative evaluations is graded. The purpose is to determine what you have learned.

Below is the information on the summative evaluation schedule and details for this course, as well as the weighting of marks:

Evaluations	***Weighting***
Mid-term Exam	30%
Project	30%
Final Exam	40%
Total	100%

Institutional requirements

Student's commitment

By registering for this course, you commit to:

- *obtain the necessary course materials at the start of the semester;*
- *respect the copyright;*
- *participate in the learning activities, formative and summative evaluation activities outlined in the course calendar;*
- *complete the work assigned to you;*
- *submit the work on time.*

Teacher's commitment

Your teacher commits to:

- *create varied learning situations that enable you to put into practice the knowledge, actions and professional behaviour of the targeted competency;*
- *plan sufficient and appropriate formative evaluation activities, involving correction and improvement, that provide frequent feedback, allowing you to be well informed of your progress;*
- *provide summative evaluations that correspond to the course's targeted competency;*
- *evaluate work according to the applicable criteria, in a fair and equitable manner within a reasonable time.*

The Institutional Policy on Evaluating Learning (IPEL) is applied to all institutional programs. Listed below are a few of its clauses:

Written language *(article 5.7)*

The teacher is responsible for identifying spelling and grammar errors and for allocating the corresponding number of marks for any given summative evaluation.

Below is the % – based on language requirements – that can be attributed to each summative evaluation:

- up to 10 %

Class attendance *(article 5.12)*

Attendance and participation in classes and evaluations are mandatory for all students.

The teacher has the responsibility of monitoring attendance and of evaluating the reasons justifying student absences from classes.

A student whose absences exceed the allowable number for the course could be denied access to the final exam for that course.

Plagiarism and fraud *(article 5.16)*

Plagiarism, attempted plagiarism or complicity in plagiarism during an assignment or any evaluated task contravenes the rules. This includes (but is not limited to):

- *the whole or partial presentation (reference, paraphrase, summary, translation, insertion) of the work of another (text, illustration, film, music, etc. on paper or online) as one's own, or failing to cite a source;*
- *the use of another student's exam during an exam;*
- *the use of an assignment done for another course or a project already submitted in the past, which is passed off as an original work.*

Fraud, attempted fraud or complicity in fraud constitutes an infraction.
This includes (but is not limited to):

- *the possession or use of any unauthorized document, material or equipment during an exam, including the use of technological tools;*
- *the execution of an evaluated task by another person;*
- *the substitution for another person during an exam, assignment or any evaluated task;*
- *the possession of the questions or answers of the exam;*
- *the obtainment of any aid not authorized in advance by the teacher.*

Plagiarism, attempts at plagiarism or fraud, or collaboration in plagiarism or fraud are prohibited and considered serious offences. Thus, any instances of plagiarism or fraud will lead to a grade of '0' for the assignment in question. In addition, a note will be made in the student's file and the student will receive a written notice from his or her Program Directorate to that effect.

In the case of recidivism, in the same course or in another course, the student will be given a grade of '0' for the course in question. A second note is made in the student's file and the student will receive a summons from his or her Program Directorate. For a third offence, he or she may be expelled from the College.

Submission of work and tests *(article 5.8)*

All assignments must be submitted in class at the time designated by the teacher. Any late submissions result in a grade of zero (0).

Upon presentation of an official supporting document or valid reason for the absence, the student may request an extension from the teacher, who may accept or refuse the student's work and apply a penalty for the lateness.

Program Directorates do not accept student work. Assignments must be submitted directly to the teacher.

Rules and regulations to follow

Late arrivals

The teacher may refuse to admit to the classroom any student arriving late. A late arrival is considered an absence for that period.

Note: Students arriving late must recognize that the information they missed will not be repeated. Late students are therefore responsible for asking their peers about the material they missed. Arriving after the break, as well as leaving before the end of the class, may result in one or more hours of absence.

Eating and drinking in class

Eating and drinking are prohibited in the classrooms, locker rooms and Documentation Centre. Food may only be eaten in the cafeteria, vending machine areas and student lounges.

Mandatory course material

- USB flash disk

- Notebook for taking notes

Bibliography for this course

GABILLAUD, Jérome. *SQL Server 2014 - SQL, Transact SQL*. ENI,2015

GORMAN, Tim, Inger Jorgensen , Melanie Caffrey. *Beginning Oracle SQL: For Oracle Database 12c.* Apress, 2014

Oracle. Database SQL Language Reference

<https://docs.oracle.com/database/121/SQLRF/toc.htm>

Academic Studies Directorate approval: *Signature and date of approval*

Daniel Dubreuil pour la DE

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