LaSalle College Montréal	**Course Number: 420-CT2-AS** **Course Title: Object-Oriented Programming Concepts** **Teacher: Quang Hoang Cao** **Session: Winter 2021**

Final Project

Evaluation Weight: 30 % (out of the total mark for the course)
Due Date: April 22, 2021 (Demo and Submission via LEA)

Objective

This final project helps you to master the competency required for the course. The project focuses on designing, implementing and testing a Windows-based application in three-tier model using object-oriented approach.

Competency-Code   Use an object-oriented development approach-00Q6

Competency: Use an object-oriented development approach-00Q6

General ministerial and institutional performance criteria:

- – Naming conventions;
- – Critical thinking, methodical, analytic and synthetic;
- – Programming efficiency;
- – Autonomy, initiative.

Elements of the competency	Performance criteria specific to each element
1. Analyze the problem.	1.1 Breakdown of the problem based on the requirements of an object-oriented approach 1.2 Proper identification of input and output data and the nature of the processes 1.3 Accurate identification of the classes to be modelled 1.4 Proper identification of the algorithms to be created

2. Model the classes.	2.1 Proper identification of class attributes and methods 2.2 Proper application of encapsulation and inheritance principles 2.3 Proper graphic representation of the classes and their relationships 2.4 Compliance with nomenclature rules
3. Produce the algorithms for the methods.	3.1 Appropriate identification of the operations necessary for each method 3.2 Proper identification of a logical sequence of operations 3.3 Appropriate verification of algorithm correctness 3.4 Accurate representation of algorithms
4.Create the graphic interface.	4.1 Appropriate choice of graphic elements for display and data input 4.2 Proper layout of graphic elements 4.3 Proper set-up of graphic elements
5. Program the classes.	5.1 Appropriate choice of instructions, types of primitive data and data structures 5.2 Logical organization of the instructions 5.3 Proper programming of messages to be displayed for the user 5.4 Proper integration of the classes into the program 5.5 Proper program performance 5.6 Compliance with the language syntax 5.7 Compliance with coding rules

Case Study

Company:

Hi-Tech Distribution Inc. (Virtual)
7122 18th Montreal, Quebec
H2A2M8
Tel: (514) 721-8662
Fax: (514) 777-8665

Hi-Tech Distribution Inc. is supplying products (computer science books and softwares) to nearly all the colleges and universities in Quebec. You are required to design and implement a windows-based application named **Hi-Tech Management System** using Visual Studio 2019, C#.

Following is the *preliminary information list* you got from **Hi-Tech** after your first contact with the company:

1. Each book record should contain the fields: ISBN, Title, UnitPrice, YearPublished and QOH (quantity on hand). Each book must be categorized. Each software must be categorized as well.

2. Each author record should contain the following pieces of information, for example, authorId (for identification in case authors have the same name), first name, last name.

3. **Hi-Tech** receives products from different publishers (suppliers): Premier Press, Wrox, Murach, Prentice Hall and more.

4. **Hi-Tech's** clients: Colleges and Universities in Quebec.
   Each college/university should contain the information such as name, street, city, postal code, phone number, fax number and credit limit (offered by **Hi-Tech** in the client's contract).

5. Order clerks can take clients 'orders (by Phone, Fax, or Email) and order payments will be made by direct withdrawal from the college/university's bank account as specified in the contract between **Hi-Tech** and the client. The order shipping date will be based on the client's required date (e.g. one day before the required date).

6. At present, **Hi-Tech** has two order clerks who are responsible for taking the clients' orders.

Users and Operations

Users	Operations
MIS Manager (Henry Brown)	• Save/update/delete employee information • Search/list employee information • Save/update/delete user information • Search/List user information
Sales Manager (Thomas Moore)	• Save/Update/Delete client information • Search/List client information
Inventory Controller (Peter Wang)	• Save/update/delete product information • Search/List product information

Order Clerks
  - Mary Brown
  - Jennifer Bouchard
	• Save/Update/Cancel clients' orders
	• Search/List clients' orders

Security

To access the system, each user is required to enter his/her valid username and password. The user can change the password when necessary.

Technical Points

For this project, you must apply all the following technical points:

1. Developing a Windows-based Application in C# in three-tier model
2. Applying Object-Oriented Concepts (Encapsulation, inheritance and polymorphism)
3. Using Interfaces
4. Creating and Using the Class Library Project
5. Creating and Using Custom Windows Controls in GUI classes (optional)
6. Data Storage (Temporary : Using Collection Classes; Persistent : Using Files (Sequential / Binary/XML)

Project Documentation

The project documentation must follow the following format

    I.   Project Description
    II.   Project Development Process

        Analysis: Summary of the application's requirements
        Design: GUI, Application Domain (Business) and Data Access Classes
        Implementation: Source Code Listings
        Testing: Test results of the application in well-defined table format
        Deploying the Application: Hardware and software requirements for
                the application [optional]

    III.   Conclusion
        Specify clearly what you have learned from this project.

Evaluation Scheme

Competency Element(s)	Evaluation Element	Evaluation Criteria and Mark Breakdown	Weight
1, 3 & 5	Data validation	▪ No invalid data will be entered into the system *(10 points)*	**10 points**
4	Interface Design	▪ User-friendly (easy navigation, clear instructions, elegant errors messages) ▪ Using colors, font sizes and font styles with purpose *(5 points)* ▪ Meeting all the project requirements *(10 points)*	**15 points**
1,2,3,4 & 5	Source Code	▪ Useful comments *(5 points)* ▪ Consistent in naming convention (*5 points*) ▪ Proper use of all the object-oriented concepts covered in the course (*15 points*) ▪ Meeting all the project requirements (30 points)	**55 points**

	- Project Demo (Oral Presentation + Sample Run) - Documentation	***Oral Presentation*** *(Using PowerPoint)* ***(10 points)*** ▪ Time Management (15 minutes) ▪ Confident in presenting the project ▪ Short and precise answers to the questions ***Final Project Report*** *(Using Microsoft Word)* ***(10 points)*** ▪ Well-defined format ▪ No spelling/grammar mistakes	**20 points**

Total	**100 points**

Important Notes and Recommendations

Penalty

- ❖ If the program gets errors (Syntax or Run-time) when running, **20 points** will be deducted from the total points.
- ❖ Logical errors will result in **0 point** for the code part related.
- ❖ Late submission and absent from the oral presentation automatically results in zero (0) for the final project.

Recommendations

- ❖ For any question concerning the final project, do not hesitate to contact me via MIO
- ❖ You should have a good plan to carry out the final project.